Commentary on the Four Corner Sockets of Cheops Pyramid

All scientific disciplines make an effort to establish a dictionary of terms that will be associated with the progress of discovery in that discipline. Since there is no text in the Great Pyramid, only shapes and spaces, if a set of terms pertinent to its architectural design were to be compiled, the language in that dictionary would necessarily be numerical. The "names" of the Pyramid's attributes, the ratios, proportions and numerical assignments of its geometry and dimensions, would become the primer for understanding its architecture and the contents within. A dictionary of the Great Pyramid would include a multiplicity of mathematical and geometrical expressions and because it is a vast repository of information, many of the entries would belong to other disciplines—physics, astronomy, biology and even psychology. The entries would be both specific and indirect. *Specific* in the sense that some number designations have a one to one correspondence to a natural function or constant. *Indirect* in that a number designation may be once removed from that which it indicates—concealed by an intervening mathematical operation. One must know the function in order to recognize the correspondence with the number. In this chapter we open the book of the architecture of the base of the Great Pyramid and explore how the features of its four corners establish the lexicon of communication used throughout the Pyramid.

The Great Endeavor

We may never know the agency, individual or organization responsible for building the Great Pyramid. Yet we might imagine that the designer of the Pyramid had a moment of inspiration, when a concept of immense proportion burst upon his consciousness. The magnitude of this insight required that it be matched by an equally superlative architectural model, one that would eloquently reflect the epitome of the accomplishments of the age. Such a model would express in its geometry and form, both the *individuality* of the moment and the *timelessness* of eternity. Such a model would communicate in design nothing less than that proclaimed by the structure of any living organism. It would be simple yet comprehensive; complex yet elegant. It would be a model of the natural order.

Fig. 1 Tourists at the Sphinx with Great Pyramid of Cheops in background. Circa 1904.

Making Contact: Architecture as Communication

"Reading" Nature and the architectural message of the Great Pyramid, requires a degree of tolerance for inexactitude. Nature though orderly, is never in lock-step, though rigorous is not tyrannical; variation prevails; individuality is always preserved. Likewise, to fully apprehend the marvel of number and geometry deployed in the Pyramid the requirement for uncompromising accuracy must be suspended. The sheer breadth of conceptual expanse indicated by the Pyramid's architecture out weighs any trivial deficiency in its execution. Our endeavor here is to contact the *intention* of the architect and to comprehend the ***mind*** that informed the design.

We hold and behold the Great Pyramid as art in the service of science. The Pyramid is ultimately knowledge of the natural order expressed artfully. There is however, a level of precision in architectural expression which does hold to rigor. It is a special category, one we have observed in many monuments and for which we reserve the designation of "sacred".[a] Properly applied, the term sacred refers to those architectural features *not in* stone but *indicated by geometrical extension from* stone, i.e. empty space. Such spaces are to be read as representing the unchanging and eternal, i.e. the perfect. This category of space is *contained*, either by enclosure or projection from, the geometry of the stones. In the Great Pyramid there are a number of examples of perfect empty space: the empty space between the top course of the truncated Pyramid and the projected geometric apex above it, the empty space of the King's Chamber, the empty space in the coffer, the Queen's Chamber niches and the empty spaces in the four corner "sockets," the subject of the following inquiry. The architecture of these empty spaces, discernible only through geometric completion is not subject to the limitations of physically derived measures. Each must be *theoretically* authenticated as no degree of precision can boast accuracy to the tenth decimal place except through use of the higher functions of math and geometry. Spaces enclosed by the extension of structural line contain the most rarefied concepts that govern a work. Stone can function to represent earth and phenomena *in* time; but space has the freedom to represent the time*less*. The *concept* of perfection can reside in the empty; hence, "nothing" can actually be, perfect.

It is both ironic and extraordinary that 5,000 years after the Great Pyramid was built, long after many of its stones have been removed, and its exterior despoiled, the fundamentals of the Pyramid's communication system are still accessible--in the empty spaces that remain. The contours of the Pyramid though eroded can still be fulfilled; its remnant geometries though faint can still be read and the sacred aspects of its architecture re-consecrated. In spite of its physical decline, the Pyramid's message has endured. "Nothing" cannot be debased.

"Whereof are the sockets made to sink? Who hath laid the cornerstones?"[b]

By the time Napoleon conquered Egypt in 1798, mountains of desert sand had enveloped the base of the Great Pyramid for over a thousand years. Huge piles of debris left from centuries of the dismantling of the Pyramid's outer casing concealed the lower portion of the Pyramid and the outline of its foundation. By the end of the 19th century much of the rubble around the corners of the Pyramid had been removed only to reveal that each of the four cornerstones on the Pyramid's base had been stripped away long before. All that remained were the four empty footprints or "sockets" that once held the corner stones in place.

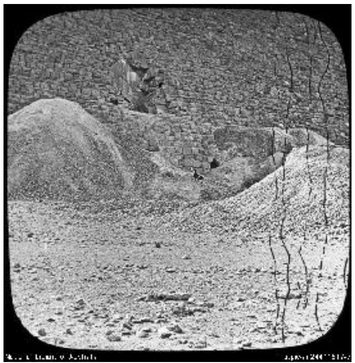

Fig. 2 Huge mounds of broken casing stone and sand surround base of Pyramid. Circa 1865.

Since they were discovered, little attention has been paid to the purpose or function of the four corner sockets. Because they are shallow in depth, it appears they had little or no practical role in stabilizing the corners of the Pyramid, nor in securing the cornerstones themselves. This detail alone suggested to me that something important regarding their function had been overlooked. After visiting the Pyramid in 1978, I came to appreciate that the purpose of the cornerstones and their sockets was not mechanical but instructive.

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[a] The notion of "sacred space" is explored in depth in other discussions and writings. See The Washington Monument: Icon by Design

[b] Job 38:1-7

My sense was that the designer of the Great Pyramid had anticipated the eventual plundering of the Pyramid’s smooth façade and cornerstones. In order to safeguard the integrity of the architectural *communication* of the structure, the architect crafted a reiterative scheme, a backup copy so to speak. If the cornerstones were removed, their dimensions could be recovered by reconstructing the geometry of the empty sockets that held them in place. The task before us is the retrieval of that communication.

Nature as Record Keeper and Architectural Model

The empty spaces of the sockets would seem to indicate a level of abstraction of which there is little to measure and nothing to weigh, yet at the same time, the sockets actually link the Pyramid to the physical world of rhythmic cycles and natural frequencies. To understand this fundamental and how it relates to the information structured in the Pyramid, we look to Nature as model.

Metaphorically, the four cornerstones and their sockets are part of the Pyramid’s “knowledge base;” they are conceptually rooted in the same fundamentals that drive all natural processes. Nature records and arranges data in the structure of living organisms. For example, as a tree grows each living cell formed around its girth, responds to the influences of its environment and to changes in the weather. Every cell in the woody body of the tree is in fact, a data point, stacked in order on the timeline of its rings. The tree’s age, its orientation, the changes in its ecosystem and more can be “read” from this timeline in a cross section taken from its trunk. These ring like layers, not unlike the layers or courses of the Pyramid, appear as a series of concentric circles, one added every year. In a year of abundant moisture the new tree ring appears thick; during a year of drought, it is thin. The tree’s rings are its history. Expert dendrochronologists read and interpret the life and times of trees from their rings. Data collected from ancient trees around the world is now used to model trends in climate change through the ages.

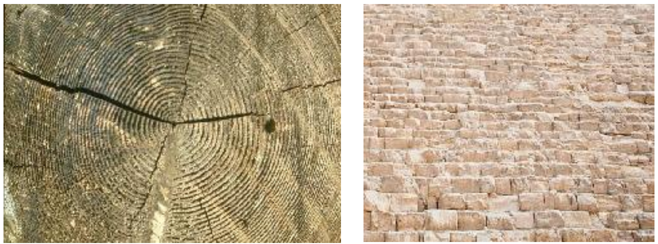


Fig. 3 The circular variation in the thicknesses of a tree’s rings visually resembles the vertical variation in the heights of the courses of the Pyramid.

Fig. 4 Ice core sample. Dark ring at right end is evidence of volcanic ash from 21,000 years ago.

The history of climatic fluctuations can also be “read” in non-living accumulations like crystals and snow. Samples of ice (Fig. 4) extracted from deep below the surface of the Arctic show layers upon layers of snowfall. Each layer captures changes in weather, water, and temperature. Every snow flake, as it falls in its turn on the timeline of history, is a record of the changes in the atmosphere which produced it. Similarly, deep in the earth, the forming crystal is itself a record in structure, of the conditions which effected its becoming—one molecule at a time.

The courses of the Pyramid can also be seen to have been organized in the same manner as a forming crystal is ordered to grow—not molecule by molecule, but stone by stone and layer by layer. Within the geometric constraints of its four sides and rectangular base, each stone on each course of the Pyramid was set down as a physical, measured representation of the day and the conditions to which it corresponds. The layered and variable structure of the Pyramid courses *is* its history and the essence of the builder's communication. We will return to the meaning of the courses and their architectural significance, but first we must address that which *underlies* the Pyramid--the platform and the corner sockets. These features give access to the "conceptual base" of the Pyramid, and all that rises above it.

The Platform

At the base of the Pyramid on the north side a few of the outer casing stones that once covered the courses can still be seen. (Fig. 5) They sit atop a feature called the platform. The platform is a remarkably level construction of finely finished, tightly set, limestone blocks. The courses or layers of the Pyramid over which the casing stones were laid, are stacked on this built foundation. The height of the Pyramid to the top course and the depth of the sockets to the bedrock are generally measured from the *top of the platform.* The platform extends out a little beyond where the edge of the casing stones would have intersected it. Underneath the platform the bedrock was carved out to accommodate the leveling of each platform stone at a uniform height of **20.6** inches. This accomplishment alone makes the platform an engineering marvel rivaling the achievement of other masonry found throughout the Pyramid. Besides creating a structural foundation, the platform was meant to be and to be seen as a true and level feature. The platform provides the "base-line" for reading the courses stacked above it and the sockets that lie below it. When a measure is taken relative to the top of the platform, its departure above or below the "baseline" of the platform can be considered as an information data point.

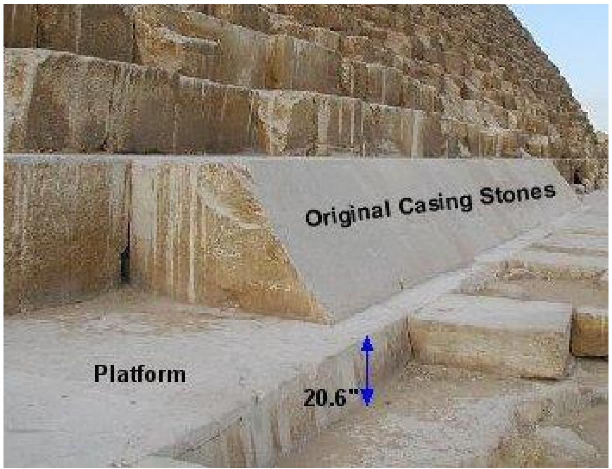


Fig. 5 Recent photo of the north side of Pyramid showing where edge of the remaining casing stones meets the top of the platform. Height of platform at 20.6". Height of Pyramid and depth of sockets is measured from the *top* of the platform which is quite level all around the base.

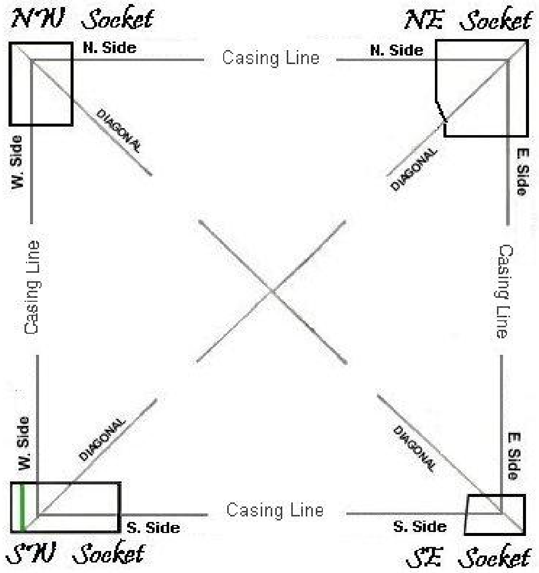


Fig. 6 Relative Positions of Sockets on Base of Great Pyramid.

Though the platform is under the Pyramid, the corner sockets are somewhat "outside" the courses and not part of the *body* of the Pyramid itself. Each of the four sockets has a distinctive shape, a particular purpose and a particular communication style, symbolically *anchoring* the Pyramid to the bedrock and to the rhythms and frequencies associated with the Earth. In the following observations, we shall endeavor to restore the sockets to their metrological and geometric integrity, and define some of the conceptual and functional elements that unify the structure.

Following are some of the terms and concepts we will recover from the sockets.

- Many natural constants and frequencies indicated by geometric and numerical relationships in the design of the sockets will be identified. These references will include geophysical constants, astronomical periodicities and mathematical operators.

- The major units of measure used throughout the Pyramid will be found expressed as factors and derivatives in the sockets' dimensions.

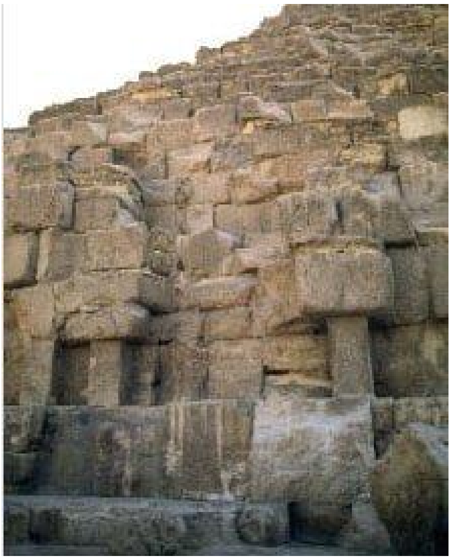
- We will show how historical efforts to define a perfectly geometric Pyramid miss the mark by ignoring the importance of the irregular and uniquely shaped corner sockets. The perimeter of the Pyramid when drawn from the corners of the sockets is complementary to the "square" perimeter traditionally drawn from the bottom of the casing stones. Information occluded by imagining the base of the Pyramid as only a "square" is made available by the inclusion of the corner sockets.

- The Pyramid is the demonstration of the wiggly-ness and variance of Nature contained within a geometrical form. This juxtaposition of Nature and number in the Pyramid's geometric form provides access to a mathematics not available from Nature alone. The synthesis of number, nature and geometry is central to the genius of the Pyramid's design.

- The four socket depths are integral to understanding the purpose of the courses and are part of the *formula* for deciphering the courses. The courses, as we will address in the next chapter, are the records in stone, meticulously kept for 206 years, of one thing. That one thing is the ebb and rise in the level of the water in a well between the Sphinx and Kephren's Pyramid. Close observation of this one thing, water, is the basis of the science which informs the Pyramid.

- Information can be conveyed in architecturally "empty" space. Empty space can be configured and measured and is a complement to the stony portion from which it is geometrically projected. The empty spaces of the sockets demonstrate an architectural language which requires the participation of the observer to fulfill its communication. Attention must be brought to what is not.

These and other considerations will unfold as we begin at the beginning, on the North East corner.



Recent photograph of the North East corner of the Great Pyramid.

Some Observations on the Geometry of the NE Corner Socket

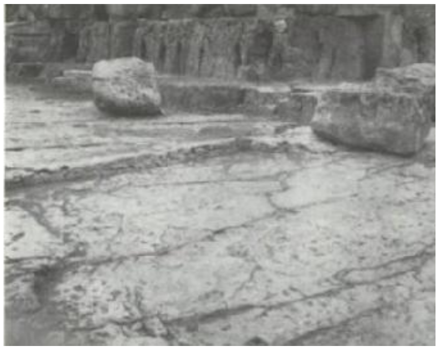


Fig. 7 Photo NE Corner Socket.

All that remains of the North East cornerstone is an impression of the stone that *was.* From its footprint it can be seen that the physical corner stone would have been a polygon with six unequal edges on its top and bottom planes. It was sunk into the earth at a depth of about 7.9 inches, 28.50 inches[c] below the top of the 20.6 inch high pavement.[d] Measuring from the top of the platform, that would be 28.5" to the bottom of the bedrock.

As I worked with the layout and dimensions of this corner I had the distinct impression that it required a leap of imagination to read and to be read. I call the North East the corner of intuition as it is oracular in nature. The proper question must be asked before the answer supplied makes sense. The numeric metaphors found in the NE corner deal largely with sums of numbers, aggregates of measure and functions of number that cross-reference categories. There are no numbers present, but with insight and liberation from the confines of categories, we can see how relationships, unaided by logic can be communicated through the filter of mathematics and measure.

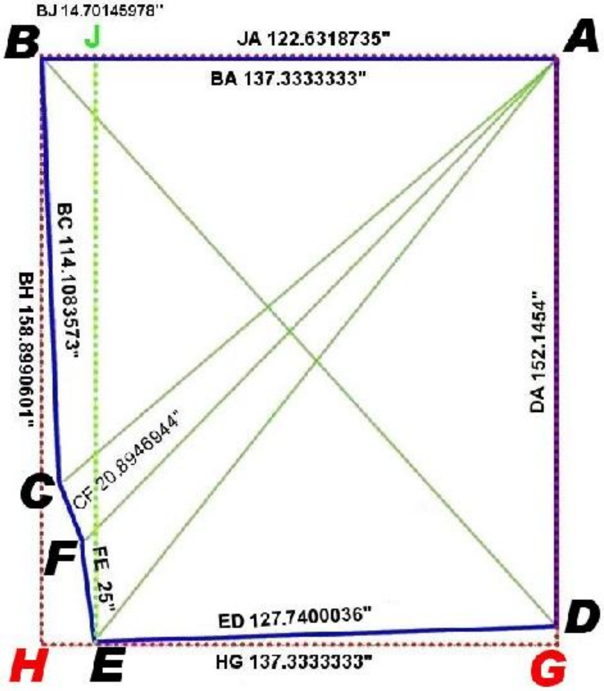


Fig. 9 Dimensions of the NE Socket floor in blue. Dotted red lines indicate rectangularized form.

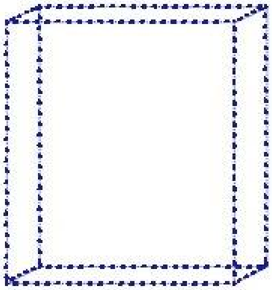


Fig. 8 Volume of the "virtual" box enclosing the NE Cornerstone is 360 cubic feet.

1. The first step toward retrieving the *concept* communicated by the geometry of the NE corner socket begins not with the cornerstone itself, but with the *imagined* rectangular box that would just fit around the stone. (Fig. 8) We could call this a "virtual" container, as it exists only in ones mind and is mentally constructed to enclose the outer dimensions of the socket's shape. The volume of this *virtual* rectangular box, which would precisely enclose all of the stone's irregularities, would be exactly ***360*** cubic feet. 360 is a number which conveys wholeness, both the "whole" of the circle of 360 degrees, and the "whole" of the Sacred Year of 360 days.

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[c] **28.50**683155 inches

[d] The depth of the sockets, as well as the height of the Pyramid, are determined from the top of the platform unless otherwise noted.

Although this rectangular enclosure does not exist, its construction is supported by the geometry of the empty socket. The invented "rectangularized" box supplies information with which to read that which is no longer present. This is an example of where the observer is called upon to participate in the intended communication and to supply that which is only inferred.

2. The second step in the process utilizes the sum of all six side lengths. The perimeter of the physical stone's top plane would have been 572.222 inches in length. The observer in possession of the cannon of astronomical timing for the planet Mercury would immediately recognize in the number of the perimeter (divided by 10) the rotation period of the planet Mercury on its axis: **57.2222** canon days. *Intuition recognizes pattern through metaphor:* The number **360** designates the cubic volume of the box the NE cornerstone would fit in, *and* the completion of the circle of Mercury's rotation of 360 degrees, in 57.222 days--a cross pollination of three categories, volume, time and degrees.

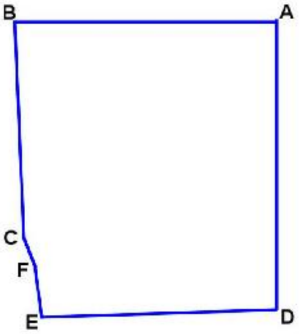

Fig. 10 Six perimeter edges of NE Corner Stone top plane.

Note: As we are "entering" the base of the Pyramid on the NE corner, it is not surprising to find a reference to the astronomical characteristics ascribed to the planet Mercury. Mercury-related numbers are encountered throughout the Great Pyramid. Swift little Mercury, first planet from the sun, mythological god of communication metes out the pulse for the whole solar system. Its rotational frequency, like a quick tempo metronome, is a key divisor of longer planetary periods. The ratios and harmonics between the planets emerge as key features in the canon system of measure. As we venture further into the interior of the Pyramid, deference to Mercury will again be observed as we enter into the King's Chamber. The first stone on the floor at the threshold bears the geometric signature of this little planet.[e]

3. Returning to the NE corner socket, the perimeter of the top plane of the virtual *box* we have constructed (Fig. 11) would be **592.4647868** inches in length. Both numbers, **360** as cubic volume of the box**,** and **592.4647868** as length, though only theoretical, share a non-linear connection with the *physical* stone. This association is bridged intuitively through the function of natural logarithms such that:

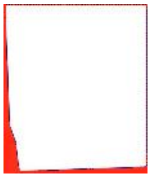

Fig. 11 Perimeter of filled out top plane of virtual "box" in red: 592.4647868".

The theoretical perimeter of the box's top surface, **592.4647868** multiplied by **360** delivers a product, 213,287.3232 which is just a number. But invoke the natural logarithm of that number, times 10, and see that it is a very close match to length (**ED**) of the polygon form on the south side of the NE cornerstone.

$$213287.3232^{e} = 12.27039547$$

$$12.27039547 \times 10 = \mathbf{122.703}9547$$

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[e] See http://www.scribd.com/bernardpietsch/d/14155359-New-Perspectives-On-The-Great-Pyramid-Pt-2-The-Well-Tempered-Solar-System for more about the King's Chamber, the planets, and the canon of measure.

The agility of intuition in a sense functions like a net. If the observer has a broad knowledge base, his net of categories can be cast wide. For one with little breadth of knowledge the net is small and the openings large. Much of value falls through. Although the number above, 122.7039547 is not *exactly* the same as the length **ED**: **122.7400036** on the south side of the stone, it is close enough to be appreciated by one who can make the association.

4. From the length of a measured *line,* we can jump to a measured length of *time* through the operation of the pendulum:

   Line **ED**: **122.7400036** divided by 100, approximates a number that unifies time and length: **1.228068554**. The measure **1.228068554** as *feet* when operated as the length of a pendulum has a period (beat) of **1.228068554** *seconds*. One figure in two dimensions: time and length. **1.228068554** is frequently referenced in canonical art for purpose of establishing a single unit which unifies time and length.

5. On the southwest corner of the **NE** Socket, side **CF** is 20.89469444" in length, which, divided by ***K*** is the number of inches in the Common Cubit:

$$\frac{20.89469444''}{\mathbf{1.0143055\ K}} = 20.6 \text{ the Common Cubit}$$

   Appropriately, side **CF** is placed adjacent to Side **FE**, which at 25", is the length of the Sacred Cubit. These two measures, the Common Cubit of 20.6" and the Sacred Cubit of 25" interact frequently, each revealing different aspects of the objects which they measure. Fig. 12

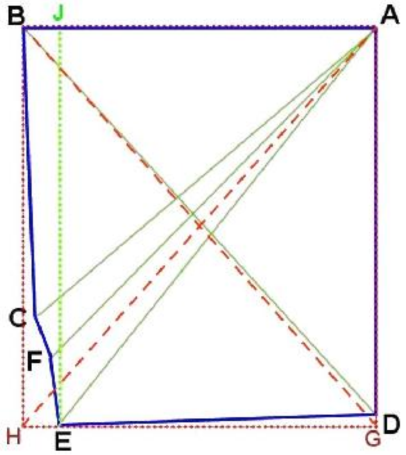

Fig. 12 NE Corner Socket- top and bottom planes view.

6. The length **AC** at 174.7572816” divided by 10 is a referent to the canon remen, sometimes called the Jewish cubit, of **17.47572816"**. The remen is an important divisor found in several places in the Pyramid. (See more on the Remen in **SW** corner section.)

7. Line **BC** on the west side of the **NE** corner, 114.1083573**"** establishes via its reciprocal (multiplied by 1^{-7}) the number of seconds in one canon Earth day or 1/360 th of one canon Earth year: **87636** seconds.

$$\frac{1}{114.1083573} = .00\mathbf{87636} \qquad .00\mathbf{87636} \times 1^{-7} = \mathbf{87636} \text{ Seconds 1 Canon Earth Day}$$

8. The NE cornerstone as a totality is more than physical stone and more than the conceptual rectangular “box” containing it. If the volume of each form is determined, we find the volume of the box to be 360 cubic feet[f] and the volume of the polygonal corner*stone* to be **339.6668422** cubic feet[g]. The ratio between the two volumes, one material and the other virtual is **1.059862**

$$\frac{360}{339.6668422} = \mathbf{1.059862063}$$

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[f] 622080 cubic inches

[g] 586,944.3033 cubic inches

With a small adjustment, the ratio number 1.059862 is very close to a perfect number **1.059932445** which via the function of the square and **minus 1**, is connected to the ordered number series **1234567890**:

$$1.059932445^{2} = \mathbf{1.1234567890} \qquad \mathbf{1.1234567890 - 1 = .1234567890}$$

In the largest sense, number order is representative of hierarchy, the basis of the language of mathematics. The ratio of that which is to that which is not, i.e., the stone to its geometric container, gives deference to the necessity of fundamental ordering principles, without which little meaning can be extracted from the soup of intuition. Order is always present; but without adequate instruments or filters to make sense of our perceptions, understanding is often overwhelmed. There will be references to number order, **1234567890** in other places in other sockets.

9. A singular conceptual instrument articulating consistency of action in the natural order is **e**, base of natural logarithms, determined as the number: **2.718281828.** In the **NE** corner it is referenced rather directly by ½ the area of the triangle drawn between corners **ABCA** on the top plane of the cornerstone:
   The area of the triangle is 7,828.651667 square inches. Divided by 2 = 3914.325834 square inches:

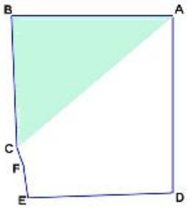


Fig. 13 Area ABCA on the NE Corner Socket.

$$\frac{7828.651667}{2} = 3914.325834 \text{ sq. inches}$$

Divide the square inches by the number of square inches in the square foot, 144 to arrive at the number of square feet: 27.18281828.

$$\frac{3914.325834}{144} = \mathbf{27.18281828} \text{ sq. feet}$$

Divide 27.18281828 by 10 to get **2.718281828,** the number of the base of natural logarithms**: e.**

10. There is an opportunity to see beyond the *given* to the *perfect* in the case of the geometry of the rectangular vertical plane on the north side of the **NE** corner socket. The indicated width of the form is 137.3333 inches; the indicated height: 28.50*683155* inches. The area would thus be **3,914.938199** square inches. By making a small allowance for the height, (less than .005 square inches) and invoking the *perfected* height of 28.50*237258* inches, a redundancy with Observation #9 above is uncovered. The area of the end plane matches one half the area of triangle **ABCA** on the top plane: **3914.132302** square inches. Division again by 144 and then by 10 delivers **2.718281828,** the number for the base of natural logarithms, **e.**

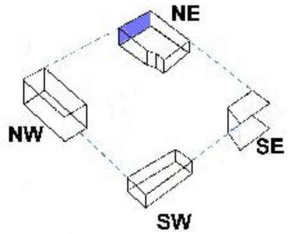


Fig. 14 Area of the north side of NE corner socket.

11. On the **NE** socket, length **AE, 200.7174325"** is the anti-common logarithm of **2.302585093** which is the natural logarithm of the number **10.**

$$\mathbf{200.7174325^{-10} = 2.302585093}$$

$$\mathbf{2.302585093^{-e} = 10}$$

This maneuver demonstrates intellect interacting with intuition. Intellect recognizes each number separately, in the proper context of its function. Intuition sees through the limited definitions of the given and perceives **2.302585093** as a *nodal point which joins* two different terrains: common and natural logarithms. The facility of the architect was to have placed in the form a length, **200.7174325"** which could be manipulated by the mind (invoking $^{-10}$) and be recognized as the number **2.302585093. 2.302585093** is a direct conduit between two systems of power—common and natural logarithms.

12. When the number **2.302585093,** the conversion number between natural and common logarithms, is released from its usual container, and taken as the cotangent of an angle, the angle would have a tangent of .4342944819. What is the angle? The angle is 23.47504023°, a figure easily associated with the approximate inclination of the Earth's astronomical orbit: **23° 47′ 50″**.

To see a number emerge from some apparently incidental mathematical process and then relate it to a known element in ones personal experience is an aspect of the function of intuition. Intuition is wide-eyed. It sees from a larger perspective the potential meaning of any single word in a sentence, any single number in an equation. From observation #9, we might entertain the question, "Where *does* the logarithm come from?" Intellect claims it as its own invention. Intuition on the other hand *senses* that the function of the logarithm is already present in nature, a sense that rises to intelligence when extrapolated through number.

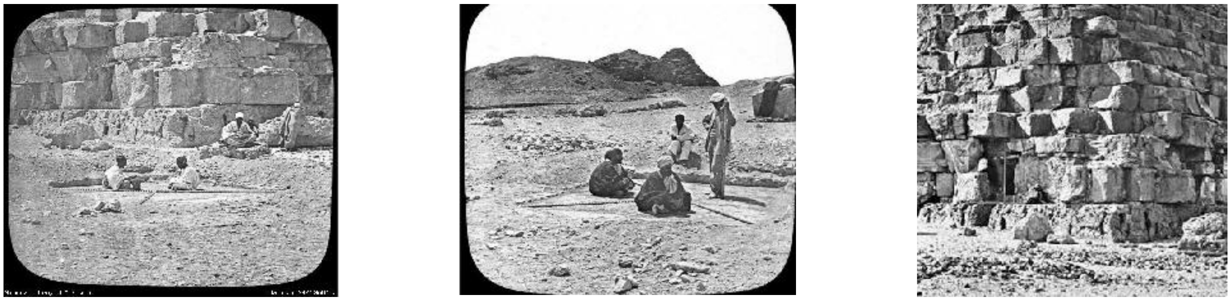


Fig. 15 Smyth's photos of the NE Corner and cornerstone socket . 1860's

The utility of number provides insight into the ordering the immense complexities of nature. The arithmetic of fractals, biological rhythms, chaos, timing, dynamics, the expansion of the universe, etc. can all be expressed numerically. Yet there are no numbers in Nature. There is no place to identify beginning or end in the eternity of changing and becoming that we call Nature. To describe all the cyclic manifestations of the natural order, we need the filter of time and a starting place from which to measure change. This brings us to the function of abstract thought and to the North West corner.

Some Observations on the Geometry of the NW Corner Socket

Fig. 16 Bernard (left) at the NW corner socket in 1978.

The first impression I had when I visited this corner of the Pyramid in 1978 was that the NW socket was rectangular. But it isn't. There are no right angles in the form. It was only after taking close measurements of the diagonals and examining the measures of earlier surveys that I recognized the hastiness of my assumption. As I continued to analyze the geometry of this corner, several conceptual number devices appeared, each useful in mathematics and engineering.

The representation for the function of natural logarithms, 2.718281828, symbolized by the letter "**e**" is the statistical referent for a ratio. The ratio regards time and distance. **e** is not an object, but the *rate of change* in the behavior of an object or process: for example the *rate* at which a bouncing ball comes to rest, could be described by **e.** Each bounce is shorter than the last by this ratio. Or notice the rate of change in the angle of the slope of a clothesline, or the compounding of interest in ones savings account. **e** is a statistic, but it is also an amazingly omnipresent and useful tool. In the NW corner there are several references to the number name of **e.**

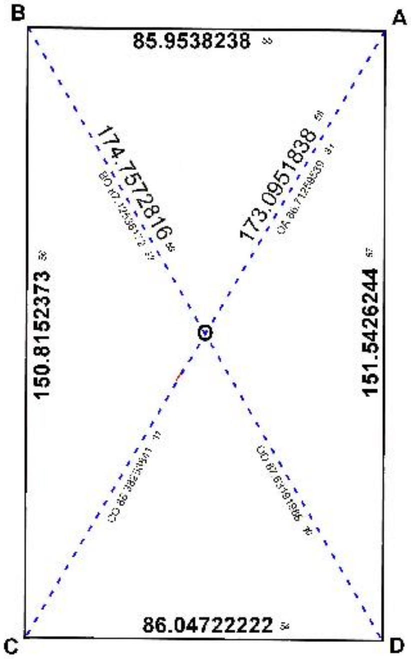


Fig. 17 Measures of NW Socket Top and bottom planes view.

13. $(1^{e})^{e}$ x 10 = 151.5426224 As inches 151.5426224 is indicated by the length of the east side of the **NW** socket, line **AD.**

14. The north side of the **NW** cornerstone **AB**, 85.9538238 inches, is what I call a "fit" measure. When I measured it at the site, the edge was crudely formed; it would be difficult to say just exactly what was intended. In order to authenticate the measure I would have to derive **AB** intellectually, meaning the measure would have to be extrapolated from other indicators.

    It was not until later when I had determined the volumes of the three other sockets that I realized the *total volume of all four corners* was meant to be seen as a unit. Ultimately the volume of the **NW** corner had to contribute to the grand volume of all four corner stones: **845.2470**834 cubic feet. I returned to the **NW** corner and to length **AB.** Since the other three sides of the **NW** corner emerged directly from canon numbers, their measures were certain. Line **AB** had to be made to *fit* with the cubic volume of the whole stone. More on the subject of "fitting" and the significance of the total volume of all four cornerstones will follow in #55.

15. The west side length of the **NW** corner, line **BC** 150.8152373" is more directly connected to perfect canon numbers in that the square root of this length, divided by 10, is the length of a pendulum which beats the same number of times in a second as the number of its length in feet: **1.22806 feet** in length @ **1.22806 seconds** per period. This familiar and oft used referent, **1.22806**8554, unites time and length and supplies the bottom line number for all systems of timing.

$$\frac{\sqrt{150.8152373}}{10} = \mathbf{1.22806}8554$$

16. The importance of the south side length **CD** on the **NW** socket, 86.0472222" arises as a referent to the statistical relationship of two functions of the human body: the heartbeat and the breath. During the time it takes to complete one inhalation/exhalation of the breath, **3.441888** heartbeats have occurred. This ratio is found by dividing 86.0472222" by the ancient measure of the Sacred Cubit of 25":

$$\frac{86.0472222}{25} = 3.441888 \text{ heartbeats to one breath.}$$

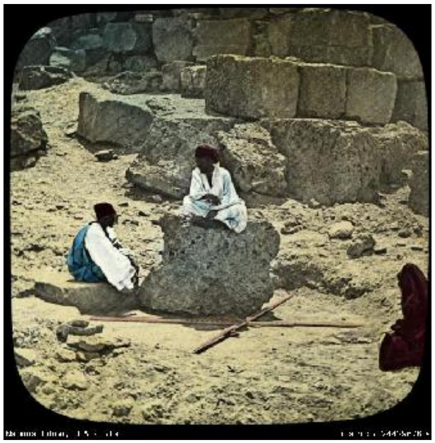
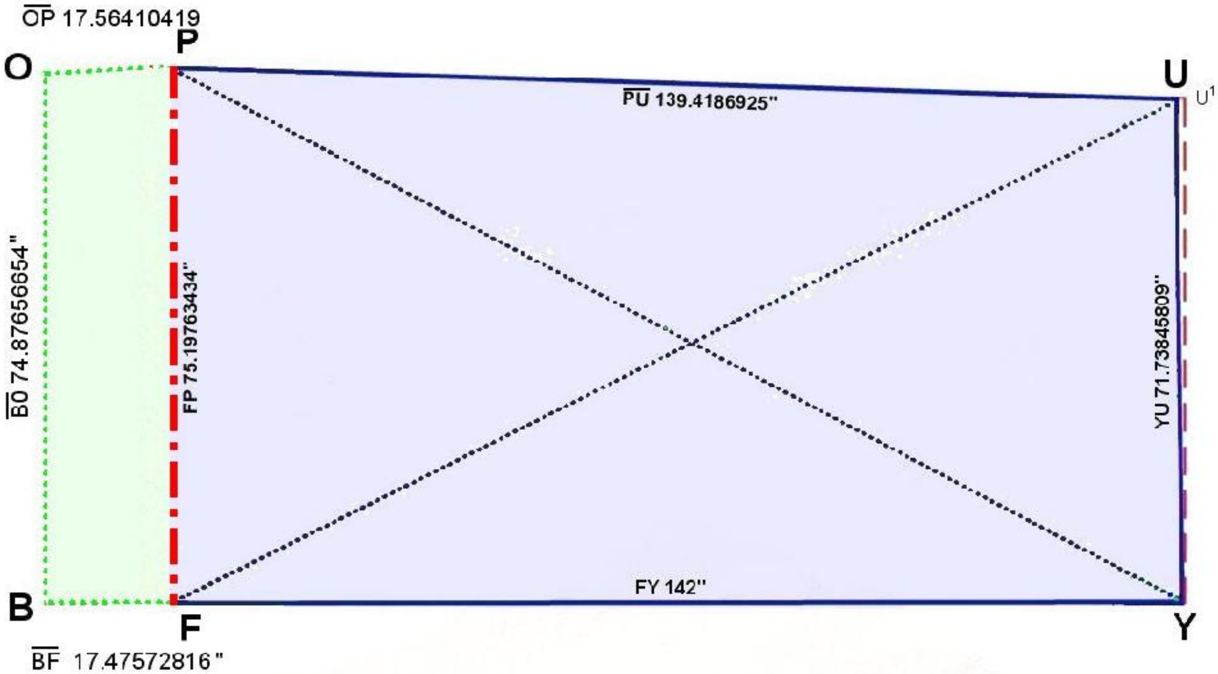


Fig. 18 Early photo NW Socket. Smyth makes note of the fallen casing stone in his drawings in Fig. 28.

Codified in canon metrology as the second of time and the minute of 60 seconds/heartbeats, the source of human's first attempts at timekeeping undoubtedly originated with the cadence of the heart. Synchronistically coupled with the cycle/circle of the year of 360 days, and projected onto the heavens, the second of time and the second of arc developed into a framework of timekeeping and celestial orientation. The origin of the links between our physiological organization and the parsing of great time periods in the cosmos are captured in the geometry of the next corner, the South West.

NW Socket 1995.

Some Observations on the Geometry of the SW Corner Socket



$\overline{OP}$ 17.56410419
P
O
U
U¹
$\overline{PU}$ 139.4186925"
$\overline{BO}$ 74.87656654"
FP 75.19763434"
YU 71.73845809"
FY 142"
B
F
Y
$\overline{BF}$ 17.47572816"

Fig. 19 Dimensions of the SW Socket, top and bottom planes view (blue area.) Green area OPFB is beyond western edge of corner socket., Dotted red Chiselled Line shown.

17. An old Arab saying declares that "Man fears time, but Time fears the Pyramids." To recognize patterns occurring over very long periods of time, time itself must be captured and counted. In the SW corner, long periodicities are assigned and accounted in structure. As shown above, the eastern edge, line **YU** at **71.73845089** inches represents in the abstract, a direct reference to the number of years it takes Earth to move through ***one degree*** of the astronomical Precession of the Equinoxes: **71.73845089** years. The precessional cycle takes **25,825.84232** canon years to complete, divide by **360** degrees = the number of years to precess through one degree of the whole cycle: **71.73845089** years.

$$\frac{\mathbf{25{,}825.84232}\text{ years}}{\mathbf{360}\text{ degrees}}$$ = **71.73845089** years to precess through one degree of the Precession of the Equinoxes. (Also the number of inches on the east side of the SE socket.)

18. For a non-logical reason, the length of line **YU, 71.73845089"** on the eastern side of the **SW** socket multiplied by **144** is the same number as the square inches on the top surface of the **SW** Cornerstone, area □**PUYFP**, **10330.33693** square inches. Fig 20.

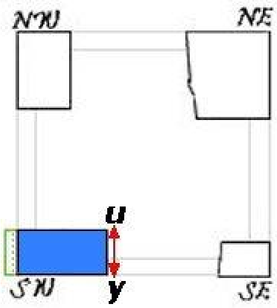


Fig. 20 Width of east side of SW socket (YU) and top surface area of the SW corner stone.

19. The number of square inches on the top surface of the SW Cornerstone, **10330.33693** square inches x **2.5** (the inches in the Sacred Cubit / 10) is the same number as the years in the cycle of the Precession of the Equinox: **25, 825.84232** canon years. (Note: The green area in Fig. 19, **□OPFB** is actually *outside* the perimeter of the Pyramid and not to be counted as part of the cornerstone.)

Area **□PUYFP Fig. 19** **10330.33693 x 2.5 = 25, 825.84232** Years in Precessional Cycle

20. Another attribute of this very long time period is found in the area of the triangle created by the diagonal between **FU** and side **YU**. (Fig. 21) The area of the triangle **ΔUFYU,** is 5090.0017909 square inches. The number 5090.017909, divided by 100, is the value of the amount of precession in *seconds of arc*, **50.90**017909 seconds per year: In one year, Earth precesses through **50.90**017909 seconds of arc of the Precessional cycle. (It takes 1,296,000 seconds of arc to complete one round of the cycle.) At a rate of **50.90**017909 seconds of arc per year, it would take **71.738 years** of *time* to move through one degree of arc. Both aspects are shown in **ΔUFYU,** one as the altitude of the triangle **71.73845089**, the other as the area of the triangle divided by 100: **5090** square inches.

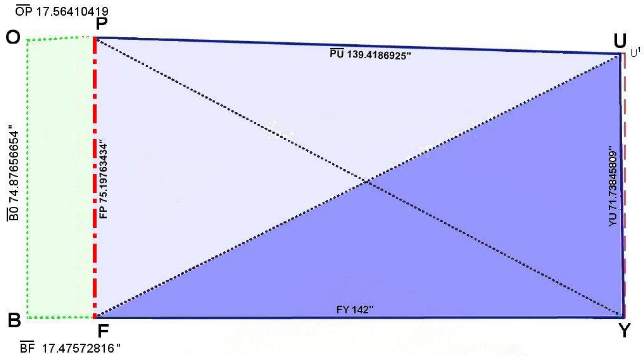


Fig. 21 SW Corner Socket showing triangle UFYU.

Much has been made of the accuracy of the Pyramid's geographic orientation. It has been considered either an extraordinary engineering achievement or an oversight falling short of perfection as indicated by the slight departure of its west side from due north. The west side of the Pyramid inclines to the west of North by **3 minutes and 55 seconds of arc** in azimuth, a figure documented in several surveys. This small detail is not accidental, irrelevant or unfortunate. It is both a delicate and a multi-layered statement that juxtaposes the smallest unit of experienced time, the human heart beat with the grandest, most abstract unit of conceptual time, the rotation of the Galaxy.

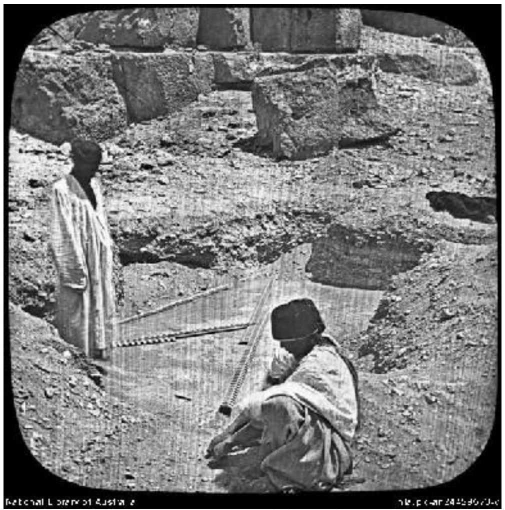


Fig. 22 Smyth Photo of SW Socket. West side is in foreground.

21. The west side of the Pyramid inclines **3'55.36528"** to the west of North. This small angle has a cotangent of **876.36**. The numeral **87636** surfaces frequently in the canon system of Pyramid metrology.[h] Most notably it represents the number of seconds (heartbeats) in the canon day of **1460.6** minutes. This is the day of which there would be 360 degree / days per year, a period often referred to as the Sacred Year. 1460.6 minutes x 60 = **87636** seconds of time. Other demonstrations of *scale* indicated by the number 87636 include:
    - **8763.6** hours in one Sacred Year of **360** days.
    - **876.36** orbits of the planet Saturn in the precessional cycle of the equinoxes of 25,825.8 calendar years.
    - **8763.6** full precessional cycles of the Earth in orbit in one rotation of the galaxy.

  .

22. The inclination of **3 minutes and 55 seconds** of arc is also recognizable as 3 minutes and 55 seconds of *time*--the difference between the duration of the solar day and the duration of the sidereal (star) day:

    1440.000000 minutes in solar day.
    – 1436.070134 minutes in sidereal day
    3.929866442 decimal minutes.

    3.929866442 read sexigesimally is
    03 minutes **55** seconds.

    Note also: **3.92**9866442[e] can be read as **50.90017909**, the number of *seconds of arc* precession, per year, in the cycle of the Precession of the Equinoxes. (See # 24 above.)

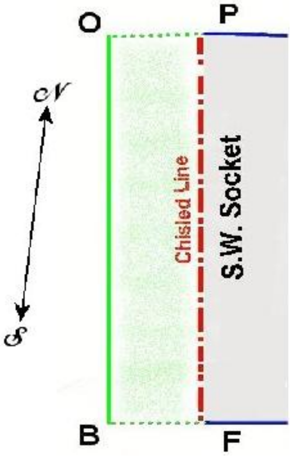


Fig. 23 Line BO and west side of the Pyramid are oriented 3'55" west of North.

This angle will be revisited in the next section where we will evolve a concept derived from the indicated geometry that lies just west of the SW corner socket, an artifact we call the Keyform Space.

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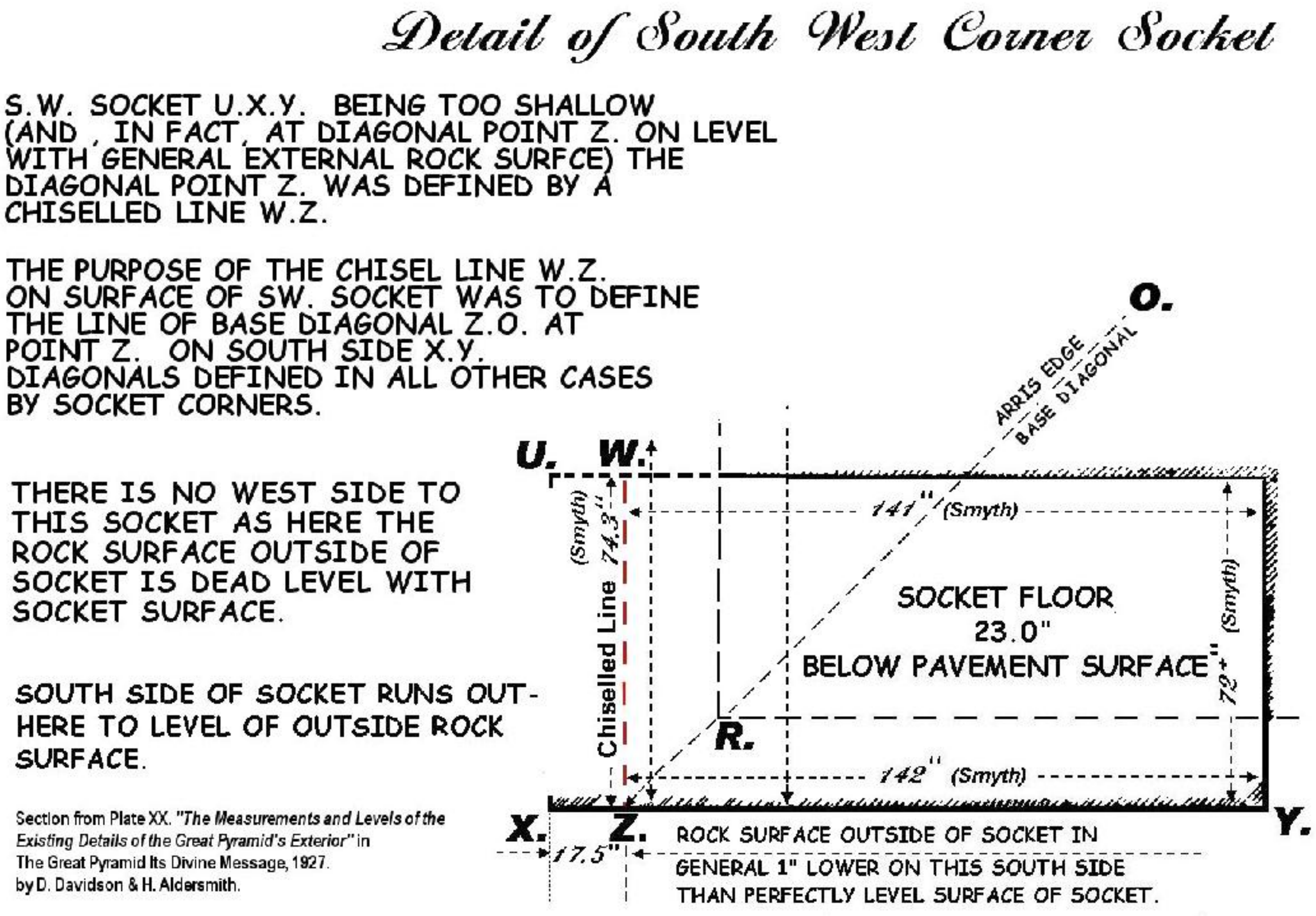
[h] We make many references to the number 87636 in other writings. A few follow here.



Detail of South West Corner Socket

S.W. SOCKET U.X.Y. BEING TOO SHALLOW (AND , IN FACT, AT DIAGONAL POINT Z. ON LEVEL WITH GENERAL EXTERNAL ROCK SURFCE) THE DIAGONAL POINT Z. WAS DEFINED BY A CHISELLED LINE W.Z.

THE PURPOSE OF THE CHISEL LINE W.Z. ON SURFACE OF SW. SOCKET WAS TO DEFINE THE LINE OF BASE DIAGONAL Z.O. AT POINT Z. ON SOUTH SIDE X.Y. DIAGONALS DEFINED IN ALL OTHER CASES BY SOCKET CORNERS.

THERE IS NO WEST SIDE TO THIS SOCKET AS HERE THE ROCK SURFACE OUTSIDE OF SOCKET IS DEAD LEVEL WITH SOCKET SURFACE.

SOUTH SIDE OF SOCKET RUNS OUT-HERE TO LEVEL OF OUTSIDE ROCK SURFACE.

SOCKET FLOOR 23.0" BELOW PAVEMENT SURFACE

ROCK SURFACE OUTSIDE OF SOCKET IN GENERAL 1" LOWER ON THIS SOUTH SIDE THAN PERFECTLY LEVEL SURFACE OF SOCKET.

Section from Plate XX. *"The Measurements and Levels of the Existing Details of the Great Pyramid's Exterior"* in The Great Pyramid Its Divine Message, 1927. by D. Davidson & H. Aldersmith.

Fig. 24 Davidson's diagram noting Smyth's observations and measures of the SW Corner Socket. The Keystone Space is initiated from U.W.Z.X.

The Keyform Space

Peculiar to the southwest corner of the Pyramid, is a small rectangular "area" which extends *beyond* the perimeter of the platform on the west side of the southwest socket. Piazzi Smyth[i] indicated it as being 17.5 inches wide on the south end and extending to the north the length of the socket, about 75". (Fig. 24) There are three noteworthy elements in this geometry. First, the bedrock outside the southern edge of the socket floor was said to have sloped down about 1 inch toward the south. Second, the sloping continued beyond the corner of the socket for about 17.5 inches to the west where, as noted by Smyth, it diminished into the surrounding rock surface. The third point of interest was a finely hewn "Chiselled Line" in the bedrock which extended along the western side of the socket. (red dashes Fig. 24)[j] The message I received from reading about this artifact was, "Pay attention here."

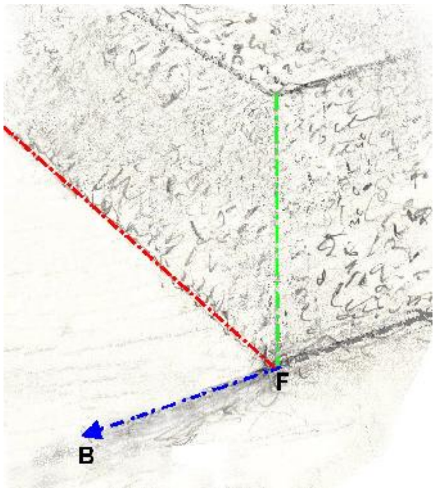


Fig. 25 Three geometric indications adjacent to the west side of the SW corner socket.

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[i] Mid-19th century Astronomer Royal of Scotland, known for painstakingly documenting the Great Pyramid's features and measures. Although working in primitive conditions and frequently debunked for advancing a Biblically inspired interpretation of Pyramid architecture, much of Smyth's work along with that of Sir Flinders Petrie is still a primary reference in Pyramid literature.

[j] The Chiselled Line is no longer visible in the socket floor as it has been worn away by foot traffic over the years.

Attending to these features moved me to construct a four sided polygon as described by Smyth. Smyth noted a width of 17.5" on the south end, I identified immediately that the intended width had to be 17.47572816", the length of the Hebrew Remen. The length of the western side of the corner socket I already had as 75.19763434", just a hair beyond Smyth's estimate. As mentioned in observation #25, the west side of the Pyramid inclines in azimuth to the west of north by 3'55" of arc. I surmised that the western side of the polygon would also have been aligned with this angle, conferring a length at 74.87656654" and width at the northern end of the form at 17.56410419". The polygonal geometry thus obtained would produce a plane of 1314.54 square inches.

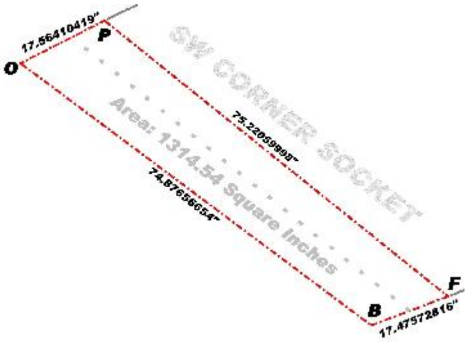


Fig. 26 Polygon: BF 17.47572816"
BO 74 87656654"
FP 75.19763434"
OP 17.56410419"
Area BFPO: 1314.54 sq."

As soon as I recognized that the area of the polygon was a referent to the number of canon feet in the circumference of the equator: 131,454,000 feet, I knew I was on the right track. Fig. 26.

From past experience I know that additional levels of information are often made available when the volume of a stone (or space) is *coerce*d into a perfect cube or rectangle, an act that changes its geometric properties but retains the quantity of its volume. Reducing an irregular form to a cube presents a new set of properties and opportunities to explore: the length of its major diagonal, the time of the major diagonal as the length of a pendulum, the area of the side, the area of the surface, to name a few. In the case being considered, I applied this process to the polygonal geometry outside the **SW** corner socket, but maintained its irregular corners and polygonal shape. I merely lifted the plane (Fig. 26) to the height of the adjacent cornerstone to make it three dimensional. I call this construction the "Keyform space." (Fig. 27) Though it has form and encloses a specific volume of space, it has no substance.

This quasi-existential form satisfies the requirement that a key to the Pyramid be both *inside* and *outside* of the structure at the same time. In itself, the Keyform is "nothing;" it is *not* physical; it is only a conceived *space.* In the following exercises as we explore the Keyform space, bear in mind that the constructions are thought forms—derivations and abstractions born from three vague indications in the bedrock outside the **SW** socket. What follows is the train of thought that transpired from my observations. Observe how a singular detail, the measure of a line, ignites a chain of associations originating from the nothing.

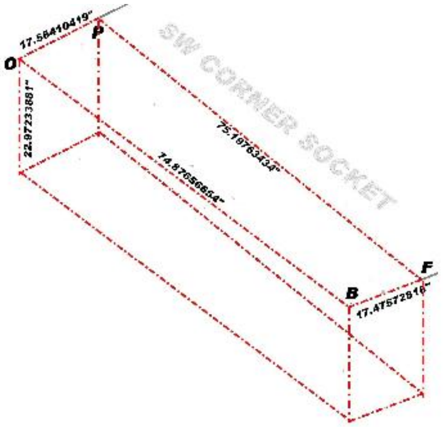


Fig. 27 Polygonal Keyform. 30,198.05826 cubic inches.

23. By drawing the corners of the plane up to the level of what would have been the height of the Southwest Cornerstone, **22.97233881"** we can now construct a three dimensional polygonal space. (Fig. 27.) The volume of the form would be **30,198.05826** cubic inches.

The Cube Within

There is a curious and rather magical circumstance about this form. In the above exercise, the height, width, and length of the box were derived from indications borrowed from the surround of the socket. The form can also be generated so to speak, in a non-linear manner from just two features: the given height of the cornerstone **22.97233881"** and the length of the Hebrew Reman **17.47572816**. This simplistic though unexpected relationship further validates the instrument we are calling the Key-form. This is how it unfolds:

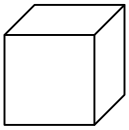
24. Recruiting the number of inches to the cubic foot, **1728,** and multiplying it by the Remen length obtains the volume of the form:

    17.47572816" x 1728 = 30,198.05826 cubic inches.

    The volume divided by the given height renders the number of square inches in the bottom and top planes:

    $$\frac{\mathbf{30{,}198.05826}}{\mathbf{22.97233881''}} = \mathbf{1314.54} \text{ square inches.}$$

    If we now *coerce* the volume of the Keyform space into a cube of six equal sides it would have a surface area of 5,818.404755 square inches. We recognize **5818** in linear inches as a referent to the Pyramid's height. In feet this would be **484.86** feet.

    By our reckoning the Pyramid's height including the apex, would be perfectly **484.8136** feet. We derive this figure from the trigonometric expression of the tangent of **one second of sexigesimal arc**, **.000004848136** and hold this relationship as the significant information byte inferred by the height of the Pyramid.

25. An incidental aside: the cube root of the volume of the Keyform, **30,198.05826** cubic inches is **31.14055436.** Synchronistically this is a match for the modern *decimal* expression of the longitude of the Great Pyramid: **31.14055436** degrees. *Sexigesimally*, this would be read as longitude 31°08' 25.9".

The geometry germinated from the seed indicator, the Remen length of **17.47572816"** is such that relevant Pyramid values can be generated and re-combined from its measure. We have observed numerous applications and transformations of this unit in the dimensions of many monuments. Some additional examples of its plasticity relative to our discussion of the corner sockets follow below.

26. The reciprocal of the Keyform width, **17.47572816,"** times 100 is the astronomical value for the planet Mercury's[k] period of rotation in cannon days: **57.222222:**

    $$\frac{1}{17.47572816} = .0572222$$

    .05722222 x 100 = **57.22222** Canon **days** Mercury rotation.

---

[k] Along with Saturn, the timing of the planet Mercury is central to the operation of canon measure. There are many and varied harmonic reciprocations between the periodicities of the two planets. Refer to the number symbolism elaborated upon in New Perspectives on the Great Pyramid Part II especially the section delineating the elements of the planets as represented in the floor of the King's Chamber.

27. **.05722**222 is recognizable as **572.2222** inches, the perimeter of the **NE** corner socket.

28. The linear inches in the base of the Pyramid as we configure it, 36515 inches divided by the length of the Remen, 17.47572816 inches delivers the number of hours in the planet Mercury's orbit: 2089.46944. Divide this by the number of hours in the canon Earth day, 24.343333 hours, to arrive at number of days in Mercury's annual orbit: 85.83333 canon days.

29. Ten times the number of the Keyform width, **17.47572816,** is intuitively linked to the rotation of the Galaxy as the length of time it takes the Galaxy to rotate through one second of arc: **174.7572816** canon years. Since there are 1,296,000 seconds of arc in one complete rotational cycle, it takes **174.7572816** canon years to rotate through one second of arc, and over 226 million years[1] to complete one rotation of the galaxy. These references to very deep structures of time and timing are again indicative of very long tradition of observation.

In the **SW** corner using Earthbound metrics of one heartbeat of time and one second of arc, we scaled-up to the precession of the equinoxes, and to the second of arc rotation of the galaxy, both vast periods of time. The knowledge necessary to envision the cosmic periodicities to which this corner speaks could not be imagined intuitively nor contrived through intellect alone. Many lifetimes of observation would have been required to capture the concept of a long period like the Precession of the Equinox—longer perhaps than the time needed to complete one full cycle...over 25,000 years. Plato alludes to this conclusion when he writes the words spoken by Solon in the *Critias.* When Solon's great grandfather visited Egypt, the temple priests told him that the historical memory of the Greeks was like "that of children" compared to the long history of the Egyptians, who could recall many deluges and many reconstructions, in other words many cycles.

The builders who constructed the Great Pyramid, most certainly utilized a technology developed over a great period of historical time. In the fourth, though not last corner of our circuit around the base of the Pyramid, we find more indications of the sophistication of their mastery and of the functional principles of timing and engineering that made the construction possible.

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[1] $\frac{\text{226,485,437 calendrical years}}{1.01430555\ \boldsymbol{(K)}}$ = 223,291,133.4 canon years is more in keeping with Pyramid measures.

(K) is the ratio of 365.15 to 360

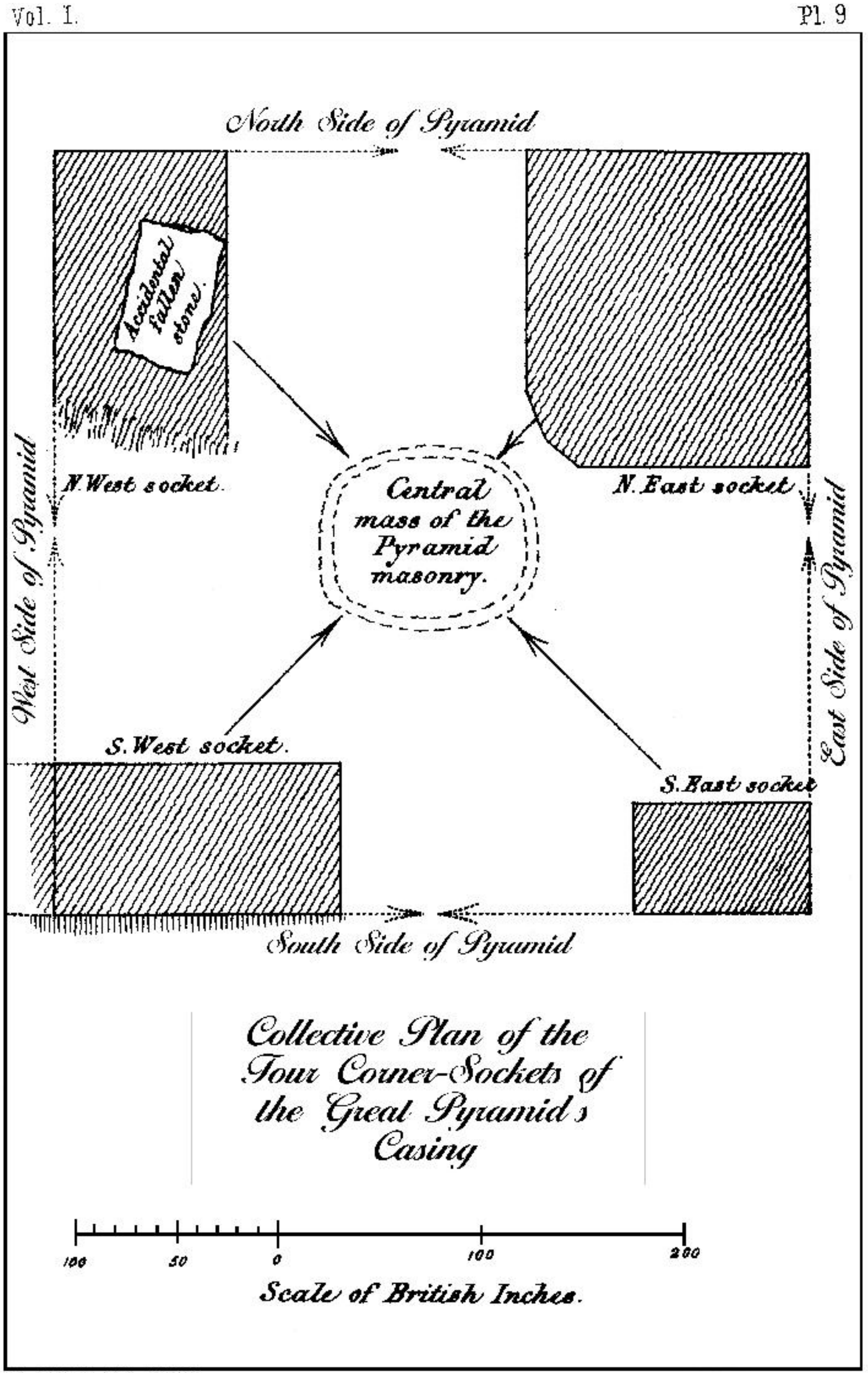


Fig. 28 Smyth's estimate of the layout of the 4 corner sockets. Note fallen stone still in situ in NW corner and debris over the south side of the NW corner, which at that time had not been removed. 1864

Some Observations on the Geometry of the SE Corner Socket

The **SE** corner is diagonally across from the **NW** corner of the Pyramid. Though the numbers on the **SE** corner have similarities with those in the **NW** corner, they are of a distinctly different cast. Metaphorically speaking, whereas the numbers of the **NW** corner are decidedly intellectual, abstract or conceptual in tone, the quality of the **SE** corner is more pragmatic. In the **NW** corner a form is *conceived*; but the functional aspects contributed by the **SE** corner can be used to manifest that form into existence. The **NW** contrives the plan; the **SE** carries it out.

If the attributes of the geometry of the **NE** corner were typified by the ephemeral, the **NW** by abstract conceptualization, the **SW** by natural patterns in time and structure, then the **SE** corner would represent the functional and efficient aspects of operationalism, most notably through expressions of **e.**

30. The number of inches in the perimeter of the top plane of the **SE** corner socket, **271.8281828,** divided by 100, is a referent to **e** the base of natural logarithms:

$$\frac{\mathbf{271.8281828}}{100} = \mathbf{2.718281828}$$

e, the base of natural logarithms is what I call a "great" number in the sense that it is mysterious and wonderful, magical and efficient. Engineers, surveyors and mathematicians alike honor it as both operational and necessary to the understanding of the dynamics of natural laws. **e** is the conjunction between function (how things work) and theory expressed as number. It is a ratio that has been assigned after a great many observations and tested in a great many situations over a long period of time.

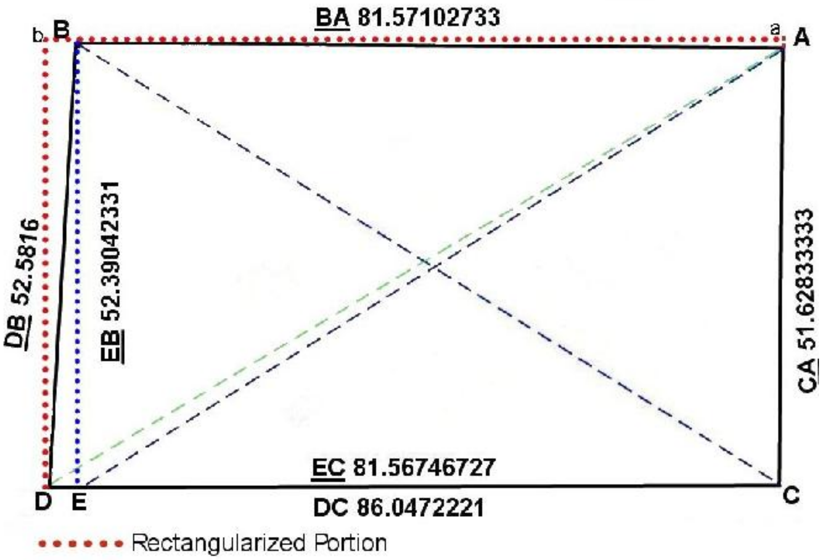


Fig. 29 Measures of the SE Socket. Red dotted is rectangularized addition.

Finally in all that follows, the perception of an ***action*** can be translated into number or a number into an event. A simple pendulum for example expresses all the laws of dynamics. What ever is driving **e** is no less than causes the pendulum to perform as it does.

The action of creating a rectangular enclosure around a polygonal form by extending the lengths of the **SE** socket until all corners are orthogonal, gives rise to additional information about the given form. The rectangularizing of the space occupied by the **SE** cornerstone by squaring the corners of the socket shape then raising the bottom plane 39.90017909" to the height of the platform, would render a rectangular volume of **179,901.6098** cubic inches. Fig. 30.

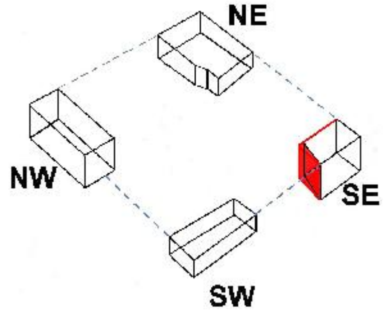


Fig. 30 The orange area is the "filled out" portion of the SE corner stone which would make it rectangular. Cubic volume of rectangularized space would be 179,901.6098 cu. inches.

31. The ratio between the *rectangularized* volume of the **SE** corner and the number representing the order of integers: 1234567890 shares nearly the same number as the number of square feet on the west side plane of the **SE** corner: **14.56**955039 square feet. Fig.31 (.002 difference)

$$\frac{179{,}901.6098 \text{ cu"}}{1234567890} = .0001457203 \times 10^{5} = \mathbf{14.\ 57}203053 \text{ derived}$$

The **SE** is the corner of the physical human in relationship to the cosmos. We are the functional match of what is happening in the cosmos. In the **SE** corner, referents to this affiliation are measures linked with the *functions* of the human body, especially in the ratio between heartbeat and breath. From this physiological relationship, evolved through eons of rotations of the galaxy, the canon of measure emerged. Each unit of the canon metric expresses a biological or physical connection to that process of evolution. It is through the interaction of heartbeat and breath, our primal time keepers, that we physiologically experience the universal dynamic of *precession*: every breath precesses. Precession makes change, growth and development possible. Precession insures the individuality of all living organisms and an open end to becoming and evolving. Without precession, the universe would be locked in endless duplication. Without precession every process would terminate in ceaseless repetition. The interplay of heart and breath and the dynamic of precession, indicated to some degree in each of the four corners is most directly organized in the geometry of the **SE** corner.

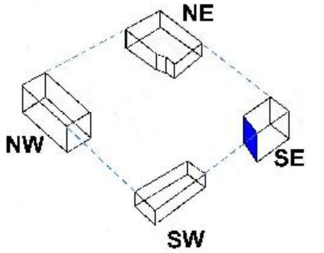
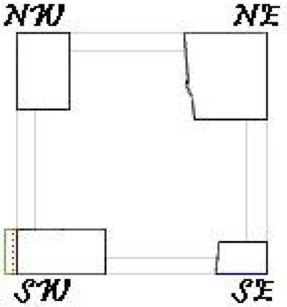


Fig. 31 Area of west side plane of SE cornerstone 14.56955039 sq. feet.

32. In the **SE** corner the metrological representation of the breath is expressed as the number of Sacred Cubits on the south side. The south side length is 86.0472222 inches. There are 25 inches in one Sacred Cubit, or **3.441888** Sacred Cubits on the south side length. **3.4418888** is also the canon designation for the number of heartbeats (seconds) during one canon breath.

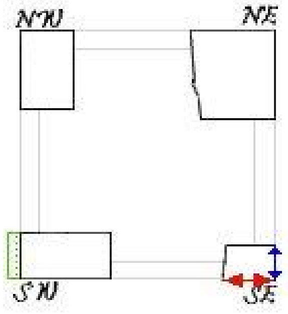


$$\frac{86.0472222"}{25"} = \mathbf{3.4418888}$$ Sacred Cubits on the south side length of the SE corner socket. Also the number of heartbeats during one canon breath.

33. These same figures also express an Earth metric, not as a linear measure but as a period of time. In one second of time, the earth rotates through **1500** canon feet on the equator. During the time it takes to breathe once (**3.4418888** seconds) the Earth will rotate through **5162.833** feet on the equator:

3.4418888 seconds x **1500'** canon equatorial rotation/ per second = **5162.83333** feet rotation

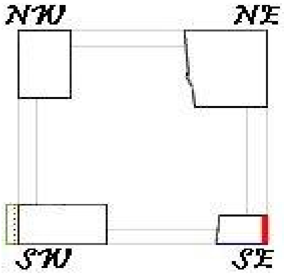
In the **SE** corner the above correlation is found in the ratio between the number of *inches* in the measure of the top of the east side edge divided by the number of Sacred Cubits on the south side edge:



$$\frac{\mathbf{51.6283333''}\text{ east side length}}{\mathbf{3.4418888}\text{ Sacred Cubits on south side length.}} \text{ X } 100 = \mathbf{1500}$$

Inches, Sacred Cubits, seconds of time, breaths, heartbeats--all are facets of an integrated system of measure, the Canon of Measure, interacting in relative scale in the body, on the equator, in time, in stone.

34. The breath as metaphor of precession is encapsulated in the length of the east edge of the **SE** corner as **51.628333** inches During the period of one canon day (360 days per year—24.3433 hours per day) **87,636** canon seconds would elapse. During one cannon day, **25,461.6** canon breath periods would have transpired: **87636** seconds / **3.4418888** seconds to a breath **= 25,461.6**. **25,461.6 is** recognizable as the number of *canon* years in the precessional cycle of the equinoxes.

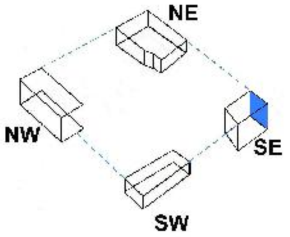


Said differently, the canon number of feet in the earth's equator, divided by the number of inches on the top edge of the east side then divided 100 is the same number as the years in the precessional cycle:

$$\frac{\mathbf{131{,}454{,}000}\text{ feet Earth equator}}{\mathbf{51.628333}\text{ inches on east edge}} = 2{,}546{,}160 \qquad \frac{2{,}546{,}160}{100} = \mathbf{25{,}461.6}$$

Feet, inches, years—the *number* is the carrier of the information, a synchronicity which may give substance to the Hindu metaphor for very long cycle of time, known as the "Breath of Brahma."

35. The common cubit of **20.6",** is again indicated in the *area* of the east side plane of the **SE** socket. The north/south line on the east side is **51.6283333"** in length. It is **39.90017909"** deep. Length x depth = area. The area of the plane divided by 100 is the measure of the canon common cubit:



51.62833333 x 39.90017909 = **2059.9797 sq"**

$$\frac{\mathbf{2059.9797}}{100} = \mathbf{20.599}$$ Very closely approximates the Common Cubit of 20.6"

36. A second synchronicity arises from the number of square inches in the area of the east side plane of the **SE** cornerstone: **2060** square inches. 2060 square inches divided by 144 is 14.3055555 square feet. The natural log (-e) of 14.3055555 is **2.660642962.** **2.660642962** is very nearly the same number as the cotangent of the Common Cubit: **20.6**

14.3055555^{-e} = **2.660**642962

The cotangent of **20.6** = **2.660**456886

Note: **14.305555** / 1000 + 1 = **K.** **K** is 1.01430555555, the ratio between the number of days in the year and the number of degrees in the circle also as 101.430555, the number of feet in one canon second of arc on the equator.

37. The top edge length of the east side **51.6283333",** divided by 1.01430555555, or **K,** is a macro reference to the rotation of the galaxy in the form of seconds of arc precession per year:

$$\frac{51.\ 628333333}{1.01430555555} = \mathbf{50.90018}$$ seconds of arc/year Precession of the Equinoxes

During the time it takes to breathe once (3.441888 heartbeats/seconds) the Earth will rotate through **5162.8333** feet on the equator. **5162.8333** feet is **50.90018** seconds of arc, each second of arc having **101.430555** feet at the equator. Note the crossing-over between these three figures, not only in scale but in category as well: Inches re-played as feet, seconds of arc precession as seconds of arc on Earth, the number of the ratio **K** converted to the number of feet in one second of arc on the equator.

38. On the top plane of the **SE** cornerstone there are two diagonals between the northeast and the southwest corners of the stone. One diagonal ***AD*** extends from actual corner to corner, the other diagonal, ***AE*** extends from the north east corner to an imagined corner formed by a vertical line (***BE***) dropped 90° from the north west corner. The difference between the two diagonal angles ∠***AEC*** and ∠***ADC*** is **4.960541056**°. The anti-common log of this number, times 4 is an indicator of the days of the solar year:

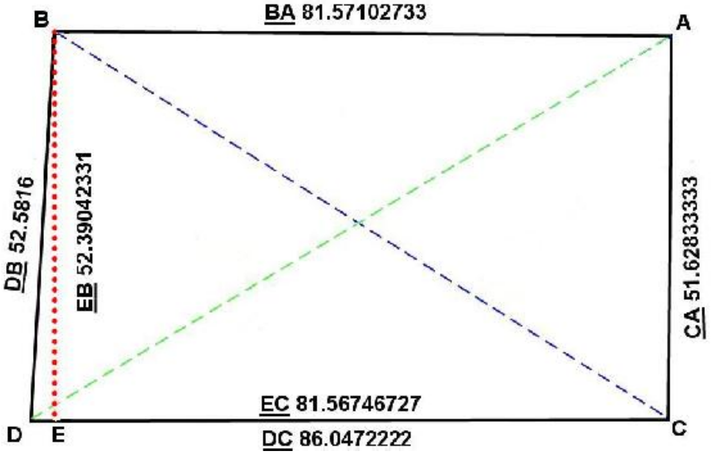
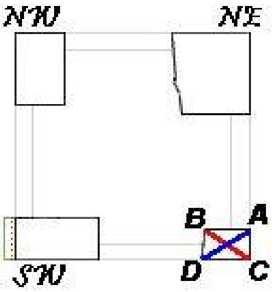


Fig. 32 SE Socket. Vertical dropped from corner B to E, red dotted line.

4.960541056^{10} is 91314.7818

91314.7818 x 4 = 365259.1727

$$\frac{365259.1727}{100} = \mathbf{365.25}91727$$ days/year



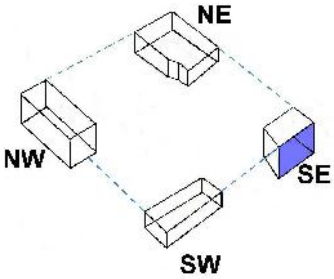
39. Another curious relationship emerges between the ratio of the two diagonals **AD** and **BC** on the top plane. When the diagonals are used as pendulum lengths, the ratio between the times given by the two pendulums is the same as the ratio between the number of days in the sidereal year, **366.26**4844 and the number of days in the canon year, **360**.

Pendulum length Pendulum period

$$\frac{\mathbf{AD}}{\mathbf{BC}}\quad \frac{100.3474426''}{96.94397885''}\quad \frac{3.204600067\text{ seconds}}{3.149786394\text{ seconds}} = \mathbf{1.017402345}$$

$$\frac{366.264844\text{ sidereal days}}{360\quad\text{canon days}} = \mathbf{1.017402345}$$

40. The area of the south side plane of the **SE** cornerstone is 23.84259259 sq. feet.[m] The reciprocal of this figure x 100 = **4.194174758,** the ratio between the number of days in Earth's canon year of 360, and the number of days in the canon year of the planet Mercury: 85.8333 days.



$$\frac{1}{23.84259259}\quad \text{X } 100 = \mathbf{4.194174758}$$

$$\frac{360\text{ canon days Earth year}}{85.833333\text{ canon days Mercury year}} = \mathbf{4.194174758}$$

41. The length of the west side of the **SE** corner socket is **52.5816** inches.
    - As **5258.16** feet, we recognize the canon mile.
    - As **525816** minutes, the minutes in the canon year of 360 days.
    - As **.525816** the additional portion of a day after 365 days in the calendar year.

42. The product of the east side length of the **SE** corner (**AC**) and the west side length (**BD**) is **2714.700372**. Divided by 12 and used as the number of *feet* in the height of a pendulum, that pendulum would have a period of **16.66**792869 seconds, very closely approximating the desired number **16.6666**, which as 1.666 invokes the ratio of decimal to sexigesimal timing: 100/60.

$$51.628333'' \times 52.5816'' = \mathbf{2714.700372''}$$

$$\frac{\mathbf{2714.700372}}{12} = \mathbf{226.225031'}$$

Pendulum Formula:

$$T = 2\pi\sqrt{\frac{\text{Length}}{\text{gravity}}}$$

$$T = \sqrt{\frac{226.225031\ (L)}{32.15481179\ (g)}} = 2.6524509$$

$$2.6524509\ \times 2\pi\ (6.2839724) = \mathbf{16.667}928\text{ seconds}$$

Note: 226.225031 feet reminds us that the third pyramid on the Giza Plateau, Mycerinus is **226** feet high. If that height were the length of a pendulum, the period of its swing would be **16.66** seconds.

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[m] 23.84 is also the number of feet between the middle of the north face and the axis of the entrance passage into the Great Pyramid (23.84' x 12 = 286.1111")

The metrological flavor of Mycerinus Pyramid indicates in *static form,* elements associated with mathematics and *operationalism*. Time and timing are key components. In the above example, the number of seconds in one canon day, **87636** seconds divided by the timing feature of the height of Mycerinus as a pendulum, **16.66** seconds, is the same number as the feet in the canon mile, **5258.16** and the same number (x 100) as the minutes in the canon year: **525816** minutes. Seconds of time, feet, minutes, pendulum periods conjoined in a single geometry. Other features associated with this pyramid make it part of the larger book that is the Giza Plateau.

$$\frac{87636}{16.666} = \mathbf{5258.16}$$

43. **51.628333,** the number of *inches* on the east side length of the **SE** corner, multiplied by 12 gives a close approximation to the number of *hours* in the last quarter day of the year:

51.628333 x 12 = 619.541100 / 100 as **DMS:** 6hr 11 min 43 seconds

(More perfectly would be 6hr 11 min 51 seconds)

44. The angle ∠**ADC** is **30.96**375654°. 30.96375654° has a tangent of **.6** and cotangent of **1.666666666**. In the following, more than one place in the **SE** corner references **1.666666666**, the conversion number between decimal and sexigesimal notation:

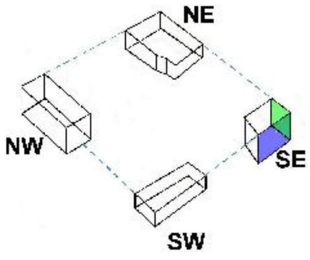
$$\frac{100}{\mathbf{1.666666666}} = 60$$

45. The area of the vertical south face of the **SE** cornerstone is **3433.33333** square inches. Divided by the area of the east side, **2060** square inches we again have the ratio **1.666666666.**

$$\frac{\mathbf{3433.33333}}{\mathbf{2060}} = \mathbf{1.666666666}$$

46. The following attributes, the area of the south face of the **SE** cornerstone and the area of the east face of the **SE** cornerstone though apparently unrelated, are both conjoined and constrained by a third feature, the cotangent of the diagonal angle across the top plane. Only if each mathematical attribute is perfect and in place, would this arrangement work:
   - the south and east sides are at right angles to one another.
   - the area of the south face is 3433.3333 square inches.
   - the area of the east face is 2060 square inches.
   - the diagonal angle ∠ADC on the top plane is **30.96**375654°
   - the cotangent of 30.96375654° is **1.666666666**.

$$\frac{3433.333333}{2060} = \mathbf{1.66666666}$$

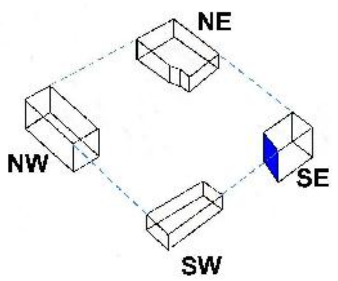


This demonstration of redundancy—wherein a third and seemingly unrelated factor, the cotangent of the top side diagonal angle, confirms the precision of the areas of the other two sides.

47. The area of the west side, **2098.035855** square inches, divided by the Sacred Cubit leads to the number of the tangent of 40°:

$$\frac{2098.035855}{25} = 83.92143539$$

$$\frac{83.92143539}{100} = .8392143539$$ the tangent of **40°** of arc.



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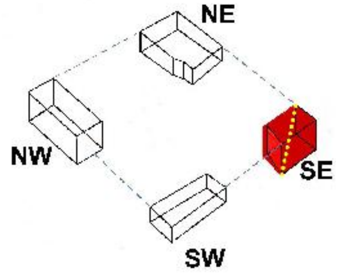

48. The major diagonal of the rectangularized enclosure of the SE cornerstone would have a major diagonal of 97.77228382 feet. I recognized this number as very closely approximating a number, but as inches, which as the height of a pendulum would beat a period of 3.1622766 seconds, the same number as the square root of 10.

A note on "fitted" numbers

After working with the dimensions of each of the corner sockets and their respective complexities, I came to the awareness that in each corner there were measures that were *close* to being canon numbers, but not quite. The question I had to ask at such moments was, "To fit, or not to fit." To "fit" a number means for me, to elevate it to its perfect canon station. In such a case I look for some corroboration, redundancy, or indication that a figure is meant to be part of an important sum of figures. Such confirmation would validate the "fitness" of that number. In each corner I found certain and derived elements that could only be reconciled by "fitting" a number.

49. On the **SE** corner for example, the north side length[n] on the top surface **AB** had to be exactly 81.57102733 inches to insure it contributed to a perfect perimeter of **271.8281828"** which, when divided by 100, was the number for **e: 2.718281828.**

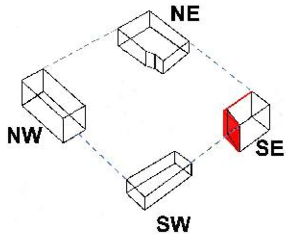

Fig. 33 The orange area is the "filled out" portion of the SE corner stone which would make it rectangular.

50. The action of creating a rectangular enclosure (Fig. 33) around the **SE** cornerstone by extending the lengths of the polygon until all its corners are orthogonal, supplies additional information about the original polygonal form. Thus rectangularized, the theoretical space occupied by the **SE** cornerstone would render a volume of **179,872.7593** cubic inches.

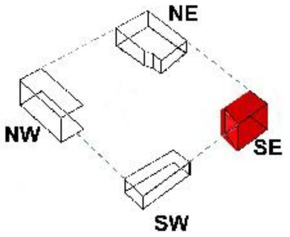

Fig. 34 Rectangularized SE cornerstone. Cubic volume of space would be 179,872.7593 cu. inches.

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[n] Smyth's measure for the north side of the SE socket was 81.5 inches.

51. The ratio between the *rectangularized* volume of the **SE** corner Fig. 34, and the number representing the order of integers: 1234567890 shares nearly the same number as the number of square feet on the west side plane of the **SE** corner: **14.54969365** square feet, Fig. 35.

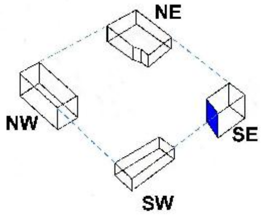


Fig. 35 Area of west side plane of SE cornerstone 14.54969365 sq. feet.

$$\frac{\mathbf{179{,}872.7593}\text{ cu"}}{1234567890} = .0001456969365 \times 10^4 = \mathbf{14.56969365}$$

(14. 56969365sq feet x 144 = **2098.035855** square inches on West side plane of SE cornerstone.)

52. Another example of making "fit" occurs with the **NE** cornerstone. The difference between the cubic inch volume of the stone and the cubic inch volume of the rectangularized space that would just contain it is a fitted number. This fitted number had to be exactly the square root of the number series 1234567890:

Volume of Rectangular Space:	360.000 cu'	(622,080. cu")
- Volume of **NE** cornerstone:	339.666 cu'	(586,944.3 cu")
Difference in Volume:	20.333 cu'	(**35,136. 41829** cu")

$$\sqrt{\mathbf{1234567890}} = \mathbf{35{,}136.41829}$$

In this case, the **NE** cornerstone was "fitted" to the perfect rectangular box that just contained its edges and had a volume of 360 cubic feet.

53. There is an aspect of fitness that involves the sum of all four socket volumes added together. Having secured the volumes of three of the four cornerstones, the **SW**, the **NE**, and the **SE**, the addition of the remaining **NW** cornerstone should lead to a sum of relevance, one that will be validated as appropriate when added to the total of the other three corner volumes.

I found validation for the fitness of the volume of the **NW** cornerstone in the figure **247.2473838** cubic feet. When the **NW**'s volume is added to the sum of the volumes of the other three, the total cubic feet in all four corners is rendered as **845.2470834** cubic feet.

SW	137.33333 cu'
NE	360 cu'
SE	100.6663661cu'
Volume of 3 Corners:	597.9996993 cubic feet
+Volume of **NW**	247.2473838 cubic feet
Volume of 4 Corners:	**845.2470834** cubic feet

54. The fitness of the single number of the total volume of all four cornerstones at **845.2470834** cubic feet lies in its facility to intersect number order, time, and geometry . In #52 above, we saw how the square root of the cardinal numbers √1234567890, comes into play in the **NE** corner. Here *number order* divided by *time* in the guise of the number of minutes in the canon day, 1460.6 x 1000, accesses another great number **760.7223758,** via the *geometric* ratio **1.111111**

which happens to approximate the cotangent of the arris angle of the Great Pyramid at 41.98721252°. This is the process:

$$\frac{1234567890}{1460600} = \mathbf{845.2470834}$$

$$\frac{\mathbf{845.2470834}}{\mathbf{1.111111111}} = \mathbf{760.7223758} \text{ Canon feet on one side of the Pyramid base.}$$

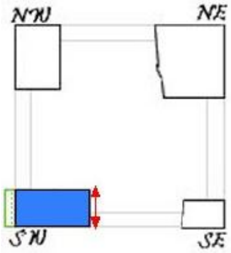
55. The number **760.7223758** has many applications. As **7.607223758** seconds of time it is the period of a pendulum a certain height. What height? 47.12265782 feet--the distance a body falls in two seconds of time.

56. The number of feet in the Earth’s circumference (131,454,000 feet) is detected in the reciprocal of **760.7223758**:

$$\frac{1}{760.7223758} = .00\mathbf{131454000}$$

57. The east side edge of the top of the **SW** cornerstone line **UY** is **71.73845089"** in length and is “fitted” to correspond to two perfect canon numbers: the number of years in the precessional cycle, **25,825.8432** years and the number of degrees in the circle: **360**.

$$\frac{\mathbf{25{,}825.8432\ years}}{\mathbf{360}} = \mathbf{71.73845089} \text{ years per degree of precession}$$



58. The east side edge of the **SW** cornerstone **UY 71.73845089** fits in another way in that when multiplied by 144 the product yields the same number as the number of square inches in the top plane of the stone.

71.73845089 x 144 = 10,330.33693 square inches on top plane of SW cornerstone.

My confidence in the accuracy of the reconstruction of the corner stones is supported by the degree of reciprocation I find among the dimensions of all four sockets. The harmonious interplay between measures, areas and volumes suggests to me that ***the cornerstones and sockets are meant to be seen as a unified architectural composition.*** From studying the layout of the sockets I observed that they share several geometric characteristics some of which are identified and grouped below. As noted, in a few cases I have yet to identify the precise relevance of some measures. This is a work in progress; other students will discover additional examples and correspondences, but in most cases I found that each cornerstone had at least:

59. *One edge or line that is "true," i.e., geometrically oriented at 90.°*

- The northeast corner of the **NE** socket is a true right angle.
- The southeast corner of the **SE** socket is a right angle.
- The southwest corner of the **SW** socket is a right angle.
- There are no right angles in the **NW** corner, although one might mistakenly assume so. All the corners are close to, but not exactly 90°.

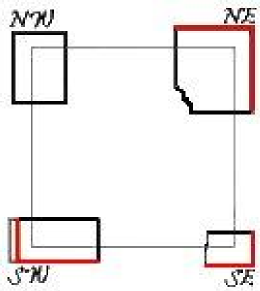
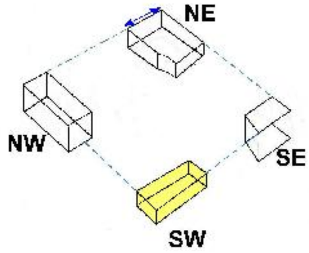


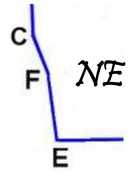
Fig. 36 Red lines indicate right angles on corners of sockets. None on NW.

60. *At least one edge or line that has a one to one reference to a canon constant.*

- The north side of the **NE** corner socket is exactly 137.33333 *inches* in length. This is the same number as the volume of the **SW** cornerstone, but as **137.33333** cubic *feet*.

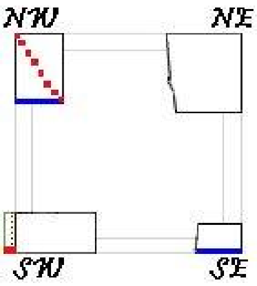


- On the southwestern corner of the **NE** socket, inclined line **FE** is exactly the length of the Sacred Cubit: **25** inches.



- In the **NE** corner the edge adjacent to **FE,** inclined side **CF** is **20.8946944**" in length. This length divided by **K** (1.01430555) is the canon *Common* Cubit of **20.6.**"

- The NW/SE diagonal of the **NW** corner socket (red) line **BD** is **174.7572816**", ten times the length of the Keystone width (red) outside the SW corner, **17.47572816"**.



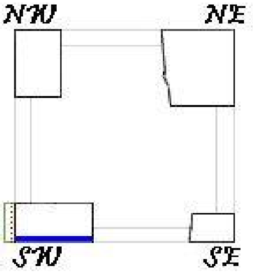
- The southern edge of the **NW** socket (blue) is the same length as the southern edge (blue) of the **SE** socket: 86.0472222 inches.

- The west side length of the **NW** is 150.8152333". The square root of this number divided by 10 is **1.228068**—a self referencing number that intersects the categories of time and length. A pendulum **1.228068** *feet* long would have a period (swing) of **1.228068** *seconds*.

- The east side length of the **NW** corner socket is **151.5426246**”, divided by 10 = **15.15426246.**

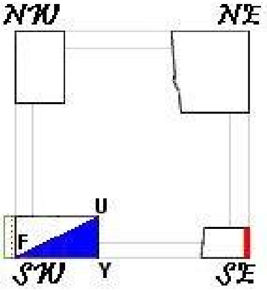
15.15426246^{-e} is 2.718281828, also known as **e**

Stated differently: **$(e^{e}$ x 10) = 151.5426246**



- The south side length of the **SW** socket is exactly **142**” in length. Used as a pendulum, this length would *beat* 22,988.87358 times during one canon day. 22,988.87358 divided by 10,000 closely indicates the number of *inches* in the height of the **SW** cornerstone: **22.97233881** inches.

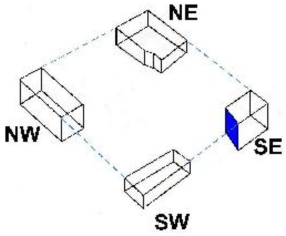
- Outside the **SW** corner, the west side length of the sloping bedrock we are calling the *Keyform portion* is inclined to the west by 03’ 55" of arc. This small but nonetheless significant departure from a true right angle was documented by both Smyth and Petrie. I recognized it immediately as a reference to the difference between the mean solar and mean sidereal days, but reckoned as 3 minutes and 55 seconds *of time*.



- The east side length of the SW corner socket **UY** is **71.73845089"**. It takes **71.73845089** canon years to precess through one degree of arc in the precessional cycle of the equinoxes at the rate of 50.909 seconds of arc per year. The ***area of triangle*** **UFYU** is 5090 + square inches.

- The east side of the **SE** corner socket, **51.628333** *inches* divided by **K** (1.01430555) = **50.90**017909, the canon designation for the number of *seconds of arc* precession, per year in the Precession of the Equinoxes. The precessional number is reiterated in the SW corner in triangle **UFYU** as described above.

- The east side of the **SE** corner socket is precisely **51.628333** *inches* in length. **51.628333** x 100 signifies the distance, in *feet* that the equator would rotate in 3.441888 seconds of time, the duration of one canon breath.



- On the **SE** corner, the inclined western edge **BD** is exactly **52.5816** inches, indicating minutes in canon year as **525816** minutes; the last quarter day of the solar year **.525816** day + 365 days = 365.25816 days, etc.

- Three of the four sockets reference **e:** NE, NW, SE. (The SW has yet to be determined.)

- Three of the four sockets reference the fundamental canon number **6.381262136**. (The SW has yet to be determined.)

- In the **SW**, the number is accessed through the socket's depth in inches, divided by 3.6:

$$\frac{22.97254369''}{3.6} = 6.381262136$$

- In the **NW**, it is via the depth of the socket in inches, divided by 5 x 1.03:

$$\frac{32.8635''}{5.15} = 6.381262136$$

- In the **SE**, we find it expressed by the number referent for the years in the precessional cycle, divided by the depth of the socket:

$$\frac{5{,}461.6\text{ years}}{39.90017909''} = 638.1324741 \qquad \frac{638.1324741}{100} = \mathbf{6.3813}24741$$

61. ***A perimeter that is associated with some other feature.***
    - The perimeter of the **NE** corner socket is **572.2222"**.
        - The reciprocal of 572.2222, times 10,000 is the same number as the length of the Keystone width outside the **SW** corner: **17.47572816"**

    - The perimeter of the **NW** corner socket is 474.3589057." (significance yet to be determined)

    - The perimeter of the **SW** corner socket is 428.354777". (significance yet to be determined)

    - The perimeter of the **SE** corner socket is 271.8281828".
        - 271.8281828 divided by 100, is a direct reference to the base of natural logarithms, **e**: . The **SE** cornerstone is defined by this measure owing to the proper fit number for the north side, 81.57102732." When the north side is added to the other 3 sides, the perimeter is perfectly 271.82818." Divided by 100, the working fundamental of the **SE** corner is obtained: 2.7182818 or **e**. The **SE** corner socket as the corner of function makes many references to this constant.

62. ***A volume that is fit, intentional and meaningful.***
    - The volume of the filled-out **NE** cornerstone is **360** cubic feet.
    - The volume of the **NW** cornerstone is **247.2**473838 cubic feet.

      247.24 *inches* divided by 12 is the Common Cubit 20.6" .
    - The volume of the **SW** cornerstone is **137.3333** cubic feet.
    - The volume of the **SE** cornerstone is **100.6663663** cubic feet. (significance yet to be determined)

63. ***The sum of all the volumes affirms the harmony of the ensemble.***
    - The sum of the volumes of all 4 cornerstones is **845.2470837** cubic feet.

      See #53 on page 28 .

Recombinant Elements

As we have been showing, numerical attributes of the Pyramid features work together and cross reference one another. In the four corner sockets the dimensions of one corner are often echoed in another corner. Correspondences may be one to one or indirect. Many are linked by a mathematical function or out-of-category association with other Pyramid features as in the following cases:

64. The volume of the **SW** cornerstone is **137.33333** cubic feet. The volume of the **NE** corner filled out to a rectangular form is **360** cubic feet. The ratio of the 2 vo*lumes :*

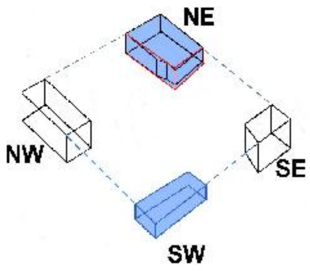
$$\frac{137.33333\ \mathbf{SW}}{360\ \mathbf{NE}} = \mathbf{.3814814816}$$

$$\mathbf{.3814814816 \times 100 = 38.14814816}$$

Use **38.14814816** as an angle inclined from 90°:

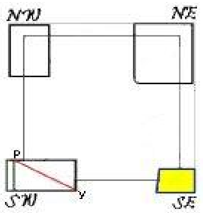
90° minus 38.14814816° **=** 51.85185185°

or **51°51′06″** the slope angle of the Pyramid.



65. The ratio of the area (square inches) of the **SE** corner's top plane divided by its perimeter (linear inches) x 10 is nearly the number of the length of diagonal **PY** in the SW corner, 160.6819349".[o]

$$\frac{4359.623805\text{ sq}''}{271.8281828''} \times 10 = 160.381597$$

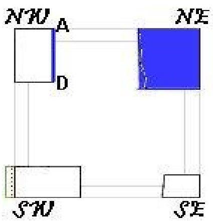


66. Note that the number for the area of the top plane of the imaginary rectangular box that would just contain the **NE** cornerstone, □**BHGAB** is 21,822.13758 square inches or **151.5426224** *square feet*. **151.5426224** divided by 10 is the same number as the square of the number for **e**.

$$\frac{\mathbf{151.5426224}}{\mathbf{10}} = \mathbf{15.15426224}$$

$$\mathbf{e} = 2.718281828$$

$$2.718281828^2 = \mathbf{15.15426224}$$



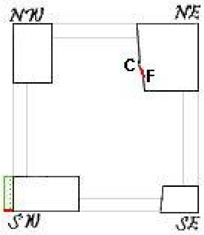
67. The number **151.5426224** is repeated in the ***NW*** *cornerstone*, as the length of the east side, line **AD**: **151.5426224** but as *inches*. Notice how in the **NE** corner, **e** was derived from an imagined or virtual area **BHGAB** --from *no*thing. But in the **NW** corner, the referent although at a remove, was derived from some*thing*—length **AD**, the physical stone.

---

[o] This same figure is closely reiterated as the number of feet between the bottom of the Grand Gallery and the Boss on the granite leaf in the anti-chamber, 160.6'

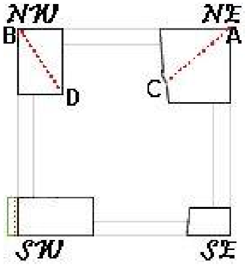
68. At the **SW** corner, the virtual line above the southern edge of the sloping bedrock west of the **SW** corner socket that we are calling the Keyform length, is **17.47572816"** long[p]. The Pyramid’s perimeter, 36515” divided by this length is 10 times a length found on the south west side **CF** on the **NE** corner socket: 20.89469444.

$$\frac{36515''}{\mathbf{17.47572816''}} = 208.9469444''$$



69. Diagonal length **BD, 174.7572816"** on the **NW** corner, is matched by diagonal length **AC** on the **NE** corner at **174.7572816."** **174.7572816** taken as time, is the number of *years* it takes the galaxy to rotate through one second of arc.

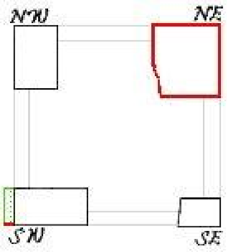
$$\frac{226{,}485{,}437 \text{ calendar years in one rotation of the galaxy}}{1{,}296{,}000 \text{ seconds of arc in } 360^\circ} = 174.7572816 \text{ years}$$



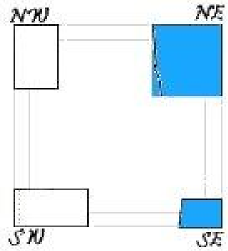
70. In a sense, the **SW** Keyform has a complement in the perimeter of the **NE** Socket which is 572.222”. The reciprocal of 572.2222 (x 10,000) is the number of the width of the Keyform:

$$\frac{\mathbf{1}}{\mathbf{572.2222}} = \mathbf{.001747572816}$$

$$.001747572816 \times \mathbf{10^4} = \mathbf{17.47572816}$$



71. The number for the area of the top plane of the **SE** cornerstone taken to the root of **e** and then multiplied by 1000 is very close to the area on the top plane of the *rectangularized* box that would contain the **NE** cornerstone. Validation by cross referencing numbers is an integral part of the deciphering process, and an affirmation to be actively sought. If one gets too far afield of the intended correspondence, the numbers will diverge wildly. A small measure of difference is acceptable and occasionally the amount of departure from an exact number can be informative in itself.



$$\sqrt[\mathbf{2.718281828}]{4359.623805 \text{ sq}''} = 21.82119817 \times 1000 = 21{,}821.19817 \text{ sq}''$$

(The area on the top plane of the NE corner fulfilled to a rectangle is **21,822.13763** sq")

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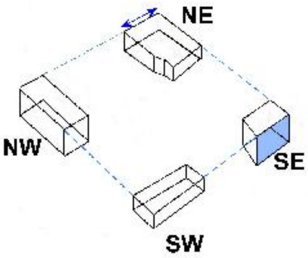
[p] The width of this indicated area, 17.47572816 inches harmonizes with the canon system. I believe this measure to be the ancient Hebrew cubit called the remen, used to define and decode numerous Hebrew artifacts including the Ark of the Covenant, and the dimensions of Noah’s Ark.

72. Another redundant arrangement occurs between the area of the top surface of the **SE** cornerstone (4359.623805 square inches) and the top surface of the *rectangularized* **NE** cornerstone (**21822.1376358** square inches). The avenue is through the root **e:**

$$\sqrt[e]{4359.623805} = 21.82119198 \times 1000 = \mathbf{21821.19198}$$

73. Taking just the number for the *square inches* in the area of the south side plane of the **SE** cornerstone, (**3433.33333)** and dividing it by the number of *linear inches* in the Sacred Cubit (**25"**) references the number of inches on the north edge of the **NE** corner: **137.333333**.



$$\frac{\mathbf{3433.33333\ sq"}}{\mathbf{25"}} = \mathbf{137.333333"}$$

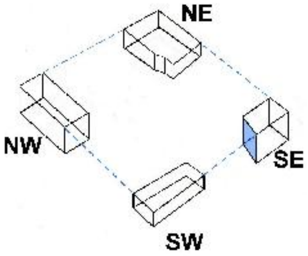
Note: The ratio of this same number **3433.33333"** to the remen or Hebrew Cubit of **17.47572816"** and divided by 10 is also the ratio of the weight of gold to the weight of water. (The measure of this cubit at **17.47572816"** is also used to decipher the Old Testament Tabernacle and Ark of the Covenant.)

$$\frac{\mathbf{3433.333333}}{\mathbf{17.47572816}} = \mathbf{196.4629629} \qquad \frac{\mathbf{196.4629629}}{\mathbf{10}} = \mathbf{19.64629629}\ \textbf{Ratio}\ \text{gold/water}$$

Fig. 37 Ratio of Weight of Gold to equal volume of Water: 19.64629629

$$\frac{\text{1200 lbs Troy/cubic foot gold}}{\text{61.08210493 lbs Avoir/cubic foot water}} = \mathbf{19.64629629}$$

74. The relationship between a Sacred Cubit (25”) and the Common Cubit (20.6”) comes into play once again when the west side area of the **SE** cornerstone at 2098.035855 sq**"** is divided by the Common Cubit number squared. The number produced x 10 is found in the King’s Chamber floor (and other places) but expressed as the number of Sacred Cubits in its perimeter:



$$\frac{\mathbf{2098.035855}}{\mathbf{20.6^2}} = \mathbf{4.944000}$$

4.944000 x 10 = 49.44 Sacred Cubits in perimeter of KC floor.

The King’s Chamber is 206" x 412" or 1236 inches in perimeter. 1236" divided by 25 inches in the Sacred Cubit = **49.44** Sacred Cubits in the perimeter of the King’s Chamber.

75. Note: In the middle of the north side of the base of the Pyramid, near where the remaining pavement stones extend out from the platform, I found another feature that is either overlooked or ignored as unimportant by investigators. At this place, the face of the platform is cut away from the vertical by one inch. The cut is **17.47572816**" wide at the top, and diminishes to a single line at the bottom, **16.66666** inches wide, leaving a wedge shape space. I measured and photographed this feature when I was last there in 1995. (See Fig. 38) In the absence of stone, I refer to this indicated geometrical wedge feature as another key-form. It utilizes both the Common Cubit of **20.6** inches, in the height of the platform, and the Jewish Cubit measure of 17.47572816 inches in its width. The dimensions of the form are an affirmation of the relational aspects of counted time **1.666**, side by side with an astronomical measure associated with the cycles of the planets, **17.47572816**, joined by the solitary unit of measure that unifies the expressions of time, distance, and weight, **the inch**. The harmonious placement of these four measures, which we have observed in the corner sockets and now find along the base perimeter, conjoined *in a space,* once again confirms their significance. Factors and multiples of these units will guide us throughout the Pyramid.

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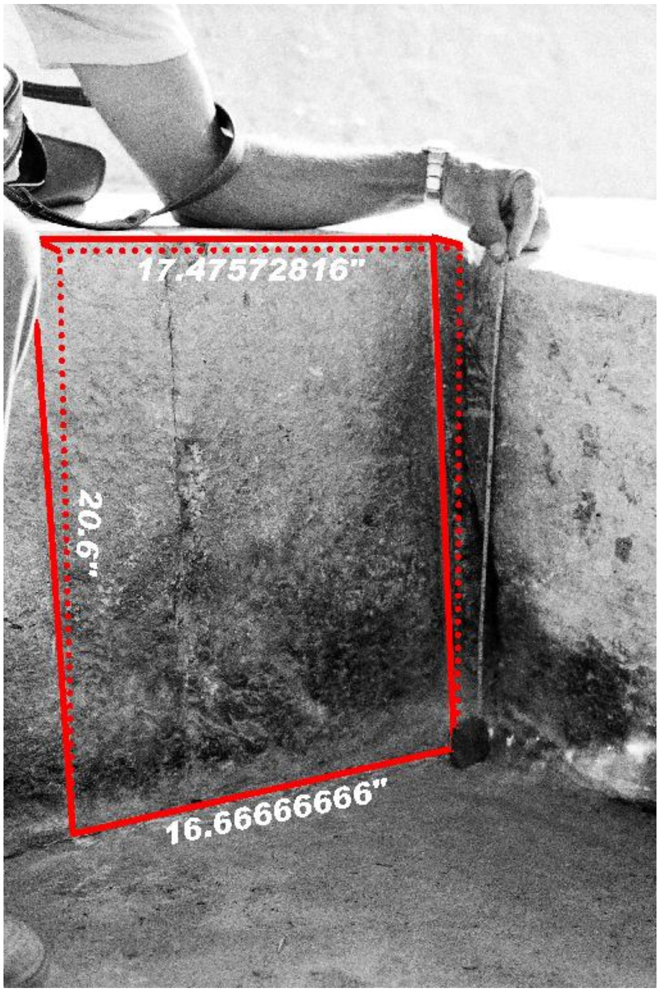
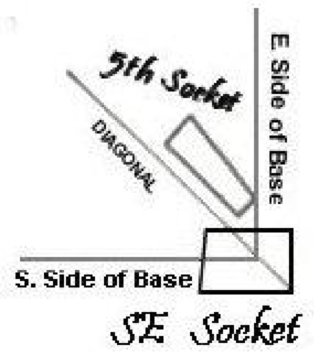


Fig. 38 Bernard measuring the wedge shaped cut-out form on the front of the platform near the middle of the north side of the Pyramid. Another "Keyform" geometry: 17.47572816" x 16.6666" x 20.6" x 1."

We have just completed making the rounds of the four corner sockets at the base of the Pyramid, but before returning to the NE corner from where we began, our attention will be redirected to an artifact of interest, not *on* the corners but *between* the **SE** and **NE** corners.



In 1920's, well into the 20th century, John and Morton Edgar uncovered the remains of another socket to the north of the South East corner socket, just inside the base perimeter.

This "5th" socket, positioned parallel to the diagonal between the SE and NW corners is polygonal in shape; each of its four sides is a different length. Historical pyramid literature has paid little attention to the significance of this feature and it is rarely referenced. Though not hidden, there was no indication of its existence nor suggestion of its purpose. Its discovery was unpredicted. My impression is that this socket, because it is not on the circuit of the corners, is not meant to be considered in the same category as the other four.

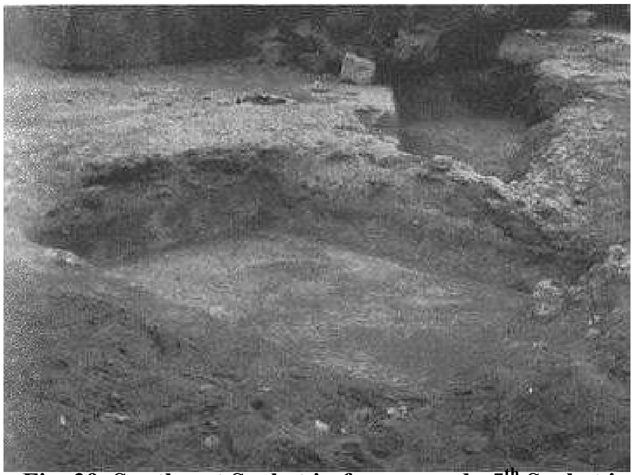


Fig. 39 Southeast Socket in foreground. 5th Socket in background to NE.

Some Observations on the 5th Socket

Encounter with the unexpected

The location of the 5th Socket hints that something of a mysterious nature is to be considered here, and that we are to be watchful for "inner" connections. If we were to continue circumnavigating the base of the Pyramid in the same mode as before, we would inevitably repeat making the rounds of the corners without advancement or elevation. The 5th Socket suggests the possibility of a short-cut, as if it were poised to indicate the direction of the next step in our progression through the Pyramid, *if* we were aware. Alas, we are unable to benefit from its instruction until a later time when its relevance will be more apparent in context with other Pyramid features.

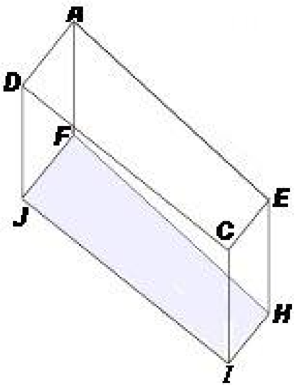


Fig. 40 Polygon shape of 5th Socket Stone

76. The bottom of the 5th socket lies plainly *inside* the perimeter and is "not on the corner". From this indication, we gather that the 5th Socket is meant to be associated with but not defined by the perimeter of the base which alludes to the cycle of the observable year of 365.15 days (365150 inches.)

77. Being a cohesive system, the heights of the four socket stones are regulated by the height of the level platform. Our presumption is that the 5th Socket, at 41.2" deep also takes its measure from the *top* of the platform

78. The shape of the 5th Socket is clearly not rectangular but polygonal--all sides are different in length. When the 2-dimensional plane of the socket floor is raised to the height of the stone which would have occupied the socket, the resulting form contains in its dimensions, elements of the canon system of measure. Consistent with its being "inside" the external perimeter of the Pyramid, the references to canon measures are "inside" or seeded within the dimensions of the socket. Some examples:

79. The western length **CD** in inches divided by the widest end of the polygon, length **AD** supplies the canon referent to **π** :

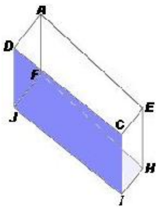
$$\frac{CD}{AD}\ \frac{97.08737864}{30.9} = \mathbf{3.141986363}$$

80. The height of the stone, 41.2" divided by 2 delivers the canon common cubit of **20.6"**.

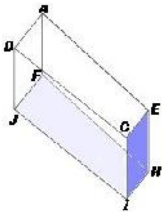
81. The height, 41.2" divided by 4 contributes 10.3", which as **1.03** we recognize as signifying the number for the ratio of the major to minor axis of Earth's astronomical orbit. The factor **1.03** has ubiquitous roots in all of Nature, everything from the abstract fundamental of the obliquity of the orbit to the manifestation in every living organism of the Golden Proportion, **.618**. (.103 x 6 = .618)

82. So as not to be missed, the signifier **1.03** is reiterated in the reciprocal of the length of the western side of the socket **IJ.**

$$\frac{1}{97.08737864} = .0\mathbf{103}$$



83. Having been provided with **π** as an operator to use in consideration with the circle, we can now look to the width of the south end of the 5th Socket as it too relates to Earth's astronomical orientation. Length **CE**, 23.65325598," read as the decimal expression of 23.65 *degrees of arc*, represents the Earth's astronomical *angle of inclination* in its orbit. Since the Earth's "orbit" astronomically considered is not circular but elliptical, this angle is slightly variable. As mentioned above, no radius in the orbit would be equal to another. The ratio of the longest (major) axis to the shortest (minor) axis is **1.03**. The juxtaposition of **π** with the circle, and **1.03** with the ellipse of the orbit enables these relationships. **1.03** and its derivatives are at the root of many dynamic natural processes; **π** and its associations is likewise coupled with purely mathematical operations. Both systems are expressed throughout the geometry of the Pyramid and their interplay makes an important contribution to our understanding of how the universe works.



84. The surface area of the polygon, 15,551.5453 *square inches*, taken as 155.52 *minutes of time*, supplies the difference between the number of minutes in the canon year of 360 degree/days and the number of minutes in the calendar year:

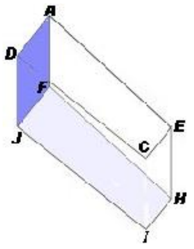
1460.6 min./canon day x 360 days = 525,816 minutes in canon year.

525,816 min. canon year + **155.52 m**inutes = 525,971.52 minutes/calendar year.

$$\frac{\text{525,971.52 min. calendar year}}{\text{1440 min. calendar day}} = \textbf{365.258} \text{ days calendar year.}$$

85. The number of days in the calendar year, **365.258**, has an interesting correspondence with precession. Subtract 365 days but retain the decimal portion .258. We recognize this perfectly as .258258432. When multiplied by 10^5 this figure can be seen as 25,825.84232, the representation for the number of years in the *astronomical* precessional cycle. 25,825.84232 divided by ***K***[q] would be **25,461.6**, signification for the number of *canon* years in the precessional cycle. Same length of time, different units.

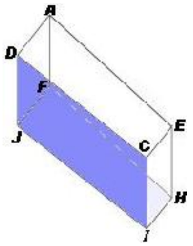
86. The canon precessional number **25,461.6** years can also be derived from the area of the northern end plane □**ADJFA**:



Length AD **30.9" x** Height DJ **41.2"** = **1273.08** sq"

1273.08 x 2 x 10 = **25,461.6** Canon years Precession of Equinoxes

87. The area of the southwestern side plane □**CDJIC** is 27.77777 square feet. The reciprocal of this area x 10^3 makes available the number **360**:



Length **CD** 97.08737864" x Height **DJ** 41.2" = Area 4000 sq"

$$\frac{\text{4000 sq"}}{144} = 27.77777777 \text{ sq'}$$

$$\frac{1}{27.77777777} = \textbf{.360}$$

88. The ratio between the height of the polygon 5th Socket stone, 41.2" and its side length **CD 97.08737864**," times 10, is the common log of the signifier for the number of cubic feet in the empty top of Cheops', the Great Pyramid:

$$\frac{41.2}{97.08737864} = \textbf{.42436}$$

$(\textbf{.42436} \times 10)^{10}$ **= 17,522.65862** as cubic feet, the volume of empty space in the top of the Pyramid.

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[q] ***K*** is 1.0143055, the ratio between calendar year days and canon year days: $\frac{365.15}{360}$

89. The area of the north end plane of the polygon, □**ADJFA** is **1,273.08** sq". This figure taken as **1.27308** is a "proper" initiatory number consistent with the foundation of Pyramid geometry as it interfaces with mathematics. **1.27308** when enrolled as the *tangent of an angle*, produces the decimal number 51.85048624°. As a sexigesimal number, this would read **51°51' 01"**.7505. The Pyramid's exterior angle.

Note: 1.03 x 1236 = 1273.08

The Rectangularized 5th Socket Stone

As with the **NE** Socket, part of unlocking the potential of the **5th** Socket involves rectifying the skewed planes into right angles. There are two methods to this function. The first involves *addin*g space to the polygon form. The second involves *removing* space from the form. In the first case we will add a wedge-like shape to the exterior of the polygon, thus completing the form to a rectangular geometry. Fig. 41

90. The volume of the wedge being *added* to the polygon to make it rectangular is 14,493.48004 cubic inches. (8.387430579 cu. feet)

The rectangular form would now be **123,600** cubic inches. An interesting feature of the rectangularized space arises when its volume is coerced into the shape of a sphere. The radius of that sphere would be **30.9** inches, the width of the north end of the 5th Socket.

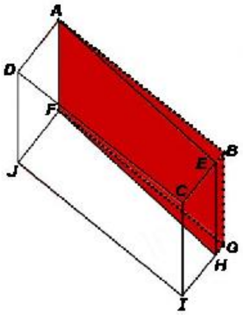
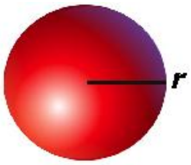


Fig. 41 Shaded area is additional space needed to "rectangularize" the original polygon form.



Formula for Volume of Sphere:

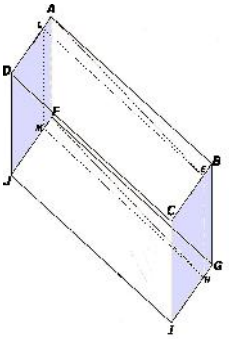
r^3 x Canon π x 1.333333 = Volume of Sphere

$\mathbf{r} = \mathbf{30.9}$ $\quad r^3 = 29{,}503.629$ $\quad$ Canon $\pi = 3.141986363$

29,503.629 x 3.141986363 x 1.33333 = **123,600** cu in. in rectangularized form.

Note: The volume number **123,600** puts us in touch with another recognizable canon figure: **1236**--the inches in the perimeter of the King's Chamber floor.

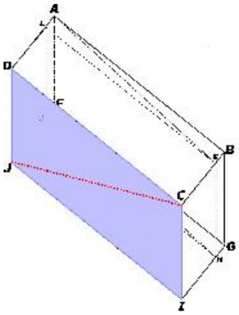
91. Another way of finding the volume of the rectangularized form is to multiply the area of the side plane of the 5th corner stone at 4000 square inches by the height of the stone at 30.9". The volume is **123,600** cubic inches.



92. **1236** is referenced again but as embedded in the areas of the north and south rectangularized end planes □ADJF and □BCIG. Each area is 1273.08 sq. inches; multiplied by 2 is 2,546.16 [r] total square inches in both planes. **2,546.16** divided by the diagonal length of the end planes**,** 51.5 inches = 49.44. 49.44 x 100 = **4944**.

    4944 divided by 4 = **1236**, another reference to the perimeter of the King's Chamber as 1236 inches. 49.44 is also a referent to the number of sacred cubits (25") in the perimeter of the King's Chamber floor.

    Note: 4944 as a number of canon years we propose, will be found to correlate with the period of a 12th planet, should it be discovered in the solar system. Our best conjecture is that the 12th planet is now nearing the plane of the galaxy and in about a hundred years (2114) will intersect the equatorial plane of the galaxy. At present, it is on the ecliptic between star 51 Ophiuchus and star 4 Sagittarius. The return of the 12th planet signals the completion of it astronomical orbit and is part of the celestial arrangement which in 2900 BCE initiated the building of the Great Pyramid. The astronomical features of the Pyramid will be dealt with at length when we consider the function of the courses, passages and air shafts in later chapters.

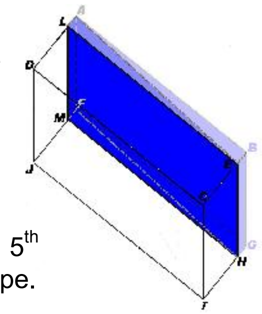


93. The rectangular side length **DC**, 97.08737864" divided by the height, 41.2" is the cotangent of the diagonal angle of the side plane **CDJIC**: 2.356489773.

    2.356489773 x 100 = **235.64**89773, the number of seconds difference between the mean solar and mean sidereal day.

    $$\frac{2.356489773 \text{ seconds}}{60} = 3.927482955 \text{ minutes}$$

    1440 .000 minutes mean solar day
    - 3.927 minutes
    1436.073 minutes mean sidereal day.



94. The second method for making the polygon rectangular is to *subtract* the wedge shape from the polygon form itself. The volume of the polygon, 109,106.52 cubic inches, minus the volume of the wedge, 14,493.48004 cubic inches, would leave 94,613.03996 cubic inches in the volume of the now rectangularized shape.

    $$\frac{94{,}613.03996 \text{ cu. inches}}{1728 \text{ cu. inches to cu. foot}} = 54.75291664$$ cu. feet in rectangularized 5th Socket, minus wedge shape.

95. When the volumes of the four corner stones were added together, we discovered in their sum a number which validated the accuracy of the individual volumes: **845.247083** cubic feet. (See section on "fitted" numbers page 26.) The question now arises, "Since another socket has joined the mix, will the cumulative volume of all five sockets be illuminating?"

---

[r] 25461.6 is also the canon number for the years in the precession of the equinoxes.

Since there are **54.75291661** cubic feet in the 5th Socket made rectangular *by subtracting the wedge*, the addition of this volume to the other four produces exactly:

845.2470834 cu. ft
+54.7529166 cu. ft
900.0000000 cu. ft

96. Another indication of the relationship between the 5th Socket and the other four is found by *dividing* their total volume by the volume of the 5th:

$$\frac{845.2470834 \text{ cu. ft}}{54.7529166 \text{ cu. ft}} = \mathbf{15.437}48052$$

15.43748052 is validated by its deep connection in the metrology of weights, measures and time. In both troy and avoirdupois systems **15.43**748052 is the number of grains to the gram. As a measure of *time*, the number for the square root of **15.43**748052, is the decimal difference between the number of minutes in the mean solar day and the mean sidereal day:

$$\sqrt{\mathbf{15.43}748052} = \mathbf{3.929}05593 \text{ or}$$

3 minutes **55**.9055 seconds.

97. $\mathbf{3.929^{-e}}$ = **50.90**017909 seconds of arc precession per year in the Precession of the Equinoxes.

Summing up

From the base of the Pyramid, on the foundation of the corner sockets we began building the lexicon of terms that would guide us by recognition through the architectural book of the Great Pyramid. The numbers are redundant and reciprocating: multipliers and factors, logarithms and cosines, angles and periodicities. It becomes clear that the developing knowledge base is largely populated by referents to natural phenomena of a cyclic nature. Not surprising since the quest for the knowledge of cycles has been the relentless pursuit of science and religion prior to the days of the Pyramids. Now finally, we are beginning to recover the legacy of the intelligence that built the Pyramid and placed *in* its stony tome, the documents which are the Pyramid records--the catalog of Time.

We have excavated from the four corners the conceptual instruments which will guide us as we travel through the contents of the Pyramid. References include geometric, math and trigonometric operators, astronomical ascriptions, Earth measures and magnetic assignments, units of counted time and linear measure. Entries in the index range in scale from the heartbeat to the movements of the planets and beyond. Relative to the cosmos, the birth and death of one human being may seem insignificant; yet the duration of one lifespan becomes a measure of relevance when

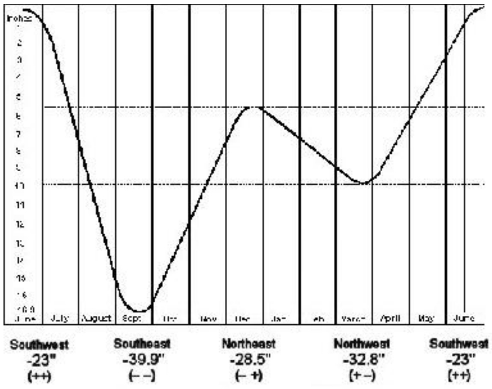


Fig. 42 Idealized tidal cycle derived by graphing the depths of the corner sockets below the top of the platform of the Great Pyramid.

marking Earth's progress through the precession of the equinoxes; even in the largest framework, reference to the smallest will be found.

The base of the Pyramid is the interface between the abstraction of geometry and the organicity of nature. It is an instruction in the translation of *geometry into time*, a relationship most graphically presented by the two dimensional illustration to the right. Fig. 39.

When the depth of each socket below the level of the platform is plotted, the result reveals a universally identifiable sine wave demonstrated in all of Nature—an eternal pattern recognizable in the timing of the seasons, in the ebb and flow of the tides, and in the signature of the human heart beat. This pattern, expressed in all of Nature is built into the Pyramid's foundation, in the depths of the sockets.

The depths of the sockets below the level plane of the platform are a metaphor in stone of the relationship between Earth and cosmos: Like the cornerstones in their sockets, the human being is "locked" to the Earth by nature. Biologically we are linked with all of life on the planet in an environment governed by interaction with the universe. Evolution is driven by incremental changes in how we respond to that environment. There is however the possibility of overriding the limitations of our biological inheritance by invoking conscious participation in the evolution of our *being*. The Pyramid is both a map for discovering our relationship with the universe and a blueprint for understanding our place in it. This is the legacy of the architect. Our task is to rise to the occasion of receiving it.

After word…

In retrospect, it was only after having studied the four corner sockets and the interior chambers that I returned to the 5th Socket with renewed appreciation of its significance. I saw that the orientation of the 5th Socket, with its bearing aligned along the diagonal angle of the Pyramid's base presented an instructive communication. I sensed its purpose a directive: "Look to the north east, toward the center of the Pyramid. The 5th Socket points the way."

Needless to say, the interior of the Pyramid cannot be penetrated without passing through the entrance and all of the intervening chambers, but if the journey could be short circuited, via the route indicated by the 5th Socket, we could skip forward to that indicated position, retrieve its gifts and with advanced instruments in hand, return to the exterior--equipped with the knowledge necessary to understand the significance of what lay before us. Fortunately our expedition is literary. We can forego the next physical step in the exploration of the Pyramid and spring directly to the destination suggested by the 5th Socket: the Grotto Stone, the 6th and next station in our investigation.

About the Appendices which follow…

Appendix I: ***Finding the Base*** describes with more detail how various historical assessments of the measures and conformity of the corner sockets relates to determining the perimeter of the base and the Pyramid angle.

Appendix II: Details of the geometric construction of the ***NE Corner Socket*** and Cornerstone. Included are the measures of the virtual rectangular form which would Contain the cornerstone.

Appendix III: Details of the geometric construction of the ***NW Corner Socket*** and Cornerstone.

Appendix IV: Details of the geometric construction of the ***SW Corner Socket*** and Cornerstone and the western extension of the socket we call the Keyform.

Appendix V: Details of the geometric construction of the ***SE Corner Socket*** and Cornerstone.

Appendix VI: Details of the geometric construction of the **5th Socket** and stone.

Appendix VII: D. Davidson’s ***Diagram of the Base of the Great Pyramid***, Plate XX from his book *The Great Pyramid Its Divine Message*. Smyth’s and Petrie’s references are noted on the diagram.

Appendix VIII: Beginning listing for a ***Metrological Lexicon*** for use in decoding the Great Pyramid and other ancient archeological monuments.

Appendix I: Finding the base of the Pyramid…

"Who hath laid the measures thereof, or stretched the line upon it?"[s]

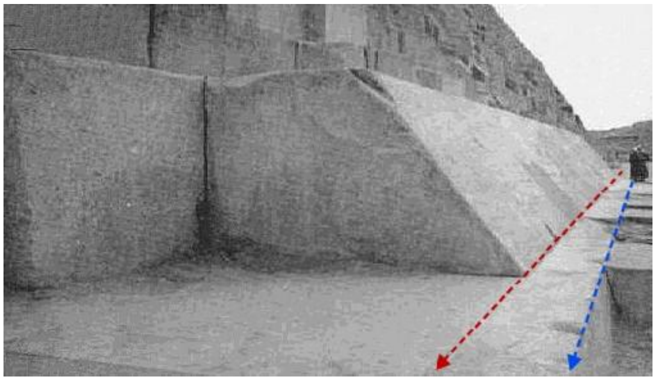


Fig. 43 Remaining casing stones on the North side of the Pyramid rest atop the platform. The red line shows the edge of the casing stones, the blue line shows the edge of the platform further out..

When the Pyramid was built, it was finished with a pristine façade or mantle of polished limestone. The mantle contacted the platform of the base with meticulous precision. The angles of the Pyramid were decisive, its architecture definitive. All was contained within.

Over the millennia the flawless outer casing stones were gradually stripped away exposing the interior stepped courses that lay beneath. Today, only a few casing stones remain at the base of the Pyramid on the north and south sides. The weathered and worn layers rising above the base are now seen as the exterior.

When Piazzi Smyth, Astronomer Royal of Scotland visited the plateau in the mid 19th century, some of the sand and rubble heaped around the Pyramid had been removed, but sections of the baseline were still obscured. Exactly where the foundation and corners lay was undetermined. Surveys of the day estimated by triangulation that the base would lie under the debris along the line where the remaining casing stones met the platform. (Fig. 43 red line) Some argued that the base should be accounted further out, along the edge of the platform stones, where the corners of the platform would meet. (Fig. 43 blue line) Each approach yielded different results as to the perimeter of the base.[t] Slight discrepancies in the taking of the measures of the perimeter have been a frequent point of contention among historical researchers. Flinders Petrie[u] who surveyed the plateau twenty years after Smyth brought technical expertise and modern surveying instruments to the task, which he used to correct Smyth's effort. Fifty years later, the Cole Survey[v] published in 1925 further refined and adjusted earlier measurements. That same year engineer D. Davidson and historian A. Aldersmith[w] published their comprehensive volume of Egyptian history, mythology, astronomy and Pyramid lore as it related to the construction and design of the Pyramid. Each investigator's work has value and bias in its approach. Although divergences among them are relatively minor, much is made of their differences, and the exact perimeter of the base continues to be a point of contention. Confirmation of the perfect physical reconstruction of the Pyramid may never be possible. Our aim here is to recover the design principle that guided the construction. Part of that principle includes the form and function of the corner sockets, which have been largely neglected. We account the sockets as being integral and unifying features of the whole-Pyramid concept.

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[s] Job 38:1-7

[t] Many variations on "Pyramid measures" have been proposed over the years, and not without controversy. Smyth, Petrie, Davidson, Isaac Newton and others tendered notions as to the lengths of the inch and cubit employed by the Pyramid designers. As their measures depart only by tenths to thousandths of a unit from one another, it would be a distraction to enumerate the various differences here. Their offerings are a matter of record. In this treatment, we have adopted measures that are intrinsically related and speak to the unity of the natural order. Since the Pyramid is about time and timing, it is fitting that our canon inch, as the primary unit of Pyramid measure, is linked to Time, in fact emerges *from* Time. The canon inch is established by a pendulum whose period is the same number as its length. As such the canon inch applies to both linear distance and to frequency. It is the perfect instrument for expressing the synchronistic relationship between time and measure. For more elaboration on the functional and esoteric dimensions of the canon inch, see our article "Art, Measure and Synchronicity" at http://www.scribd.com/bernardpietsch/

[u] Petrie, W. M. Flinders. *The Pyramids and Temples of Gizeh.* 1st ed. London: Field and Tuer; New York: Scribner & Welford, 1883.

[v] Cole, J.H. *Determination of the Exact Size and Orientation of the Great Pyramid of Giza*.. Government Press, Cairo, 1925.

[w] Davidson, D. *The Great Pyramid Its Divine Message,* Volume 1. Fourth revised edition, 1927.

Smyth and Petrie both described the top of the platform stones as "admirably level through out," a detail[x] which will help us to understand how the configuration of the corners is used to determine the dimensions of the base perimeter. As previously discussed, each of the corner sockets is sunk to a different depth in the bedrock. (The depths of the socket bottoms and height of the Pyramid are measured from the level base of the *top* of the platform stones.)

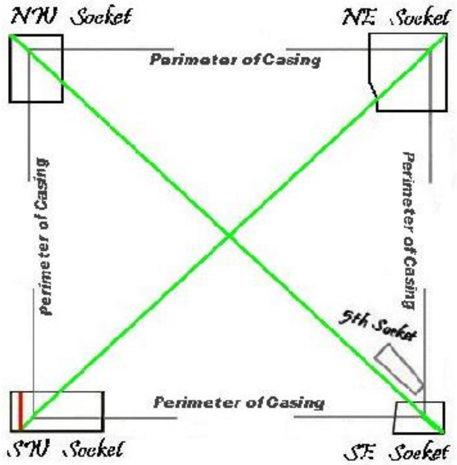

Fig. 44 Geometric diagonals intersect corner of casing and corner of socket.

Petrie's diagrams of the Pyramid's base[y] show by his calculation that the perimeter of casing stones was fairly square. Perpendicular diagonals drawn from corner to corner cross in the middle and intersect the outside corners of the opposite cornerstones. (Fig. 44) The diagonals are congruent with the arris line or edge of the rising casing stones of the Pyramid's exterior meaning that if the smooth exterior casing stones were still in place, their corners would have converged over and risen above the base diagonals.

Figure 45 to the right shows how the boundaries of the corner sockets are not uniformly parallel to the assumed perimeter of the casing stones. Because the geometry of each socket is unique, the distance from the exterior corner of each socket to the corner of the casing is a different length. (Fig. 45 green lines) When the perimeter of the Pyramid is defined only by the edges of its casing stones as they sit on top of the level platform, the perimeter would be nearly square and about 36320 inches around—a reference wanting in meaning. On the other hand, when defined by the outer corners of the four sockets, the perimeter, though slightly irregular, is very close to a number resembling the length of the solar year: 36515 inches, a significantly more relevant figure.

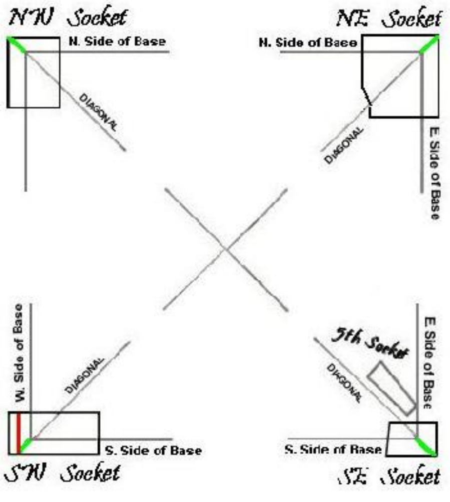

Fig. 45 Diagonals from corner of sockets to corner of casing. Each is a different length . Green lines.

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[x] Confirmed by Cole as having a "very sight slope of about 15 millimeters up from NW corner to SE corner."

[y] From D. Davidson, Plate XIX, showing Petrie's survey, page 118. See Appendix 3.

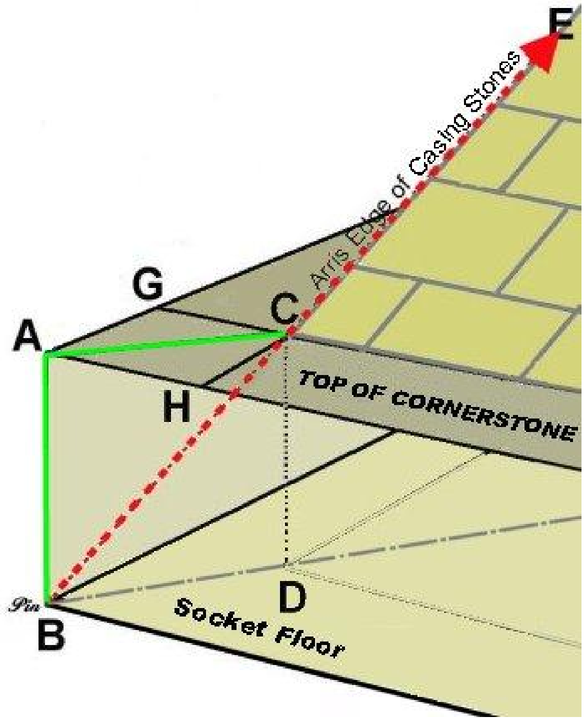

Fig. 46 Pyramid angle drawn from bottom of socket through corner of casing, red arrow.

98. Without the casing stones in place to define the exact position of the corners of the Pyramid’s base on the platform, the geometry of the four corners at platform level has to be extrapolated from what remains of the sockets and the remnant pieces of casing stone near the middle of each side at the foot of the Pyramid. (Fig. 43) Different approaches have been used for accomplishing this. The method we use establishes the position of the corners of the casing stones at platform level from the geometry of the corner sockets. From the bottom corner of the empty socket (**B)** in Fig. 46, we strike an imaginary line through the top of the platform at **(C)** and extend it all the way to the top of the Pyramid (**E**) this method confers an arris angle of the Pyramid of about 42°. (Fig. 46 red line ∠**CBD**), on each corner.

99. The point **(C)** where the corner of the casing stones meets the *top* of the platform would be designated as one corner of the four corner points *enclosing just the casing stones* on the base of the Pyramid. Using this method renders a base perimeter *averaging*[z] about **756**+/- **feet** (9072+/- inches) per side--a figure accepted by many researchers.[aa] However, recall that the four corner sockets are variously shaped and that each is sunk into the bedrock at a different depth causing the geometry and measures at each corner to be slightly different. I propose that although the sockets are partially outside the Pyramid, their significance is important enough to be included in the base and accounted in its measure. [bb]

100. For this reason, I join the outside ***bottom corners of the sockets*** (Fig. 46 **B**) where **A** on the platform would be directly *above* the pin. This perimeter includes the square perimeter of the rising casing stones of the Pyramid *plus* the distance between the corners of the casing and the socket edges (Line **CG** or **CH** Fig. 46).

---

[z] The lengths of the 4 sides of the base of the Pyramid at platform level are slightly different.

[bb] This rationale will become apparent when we begin to consider the architectural purpose of the 206 courses above the platform. Why the courses are different heights, why the four sides of the base vary and how the configuration of the corner sockets relates to the function of the courses is part of the formula for decoding the information in the courses. The courses as a data base in stone of 206 years of daily tidal records taken from a well on the plateau will be dealt with in depth in our next chapter.

The addition of the cornerstone portion to each corner of the casing renders a perimeter of **36,515** inches[cc], or **3,042.9** feet[dd]. From this reading, I obtain a nearly[ee] square average side length of **9128.75"**, or **760.7'** as the intended measure at platform level. I have found numerous indications from other features in the Pyramid which support the number **760.7** as the designation intended, especially as it relates to the arris angle of the Pyramid. (Refer back to #53, #54 and #54 on page 28.)

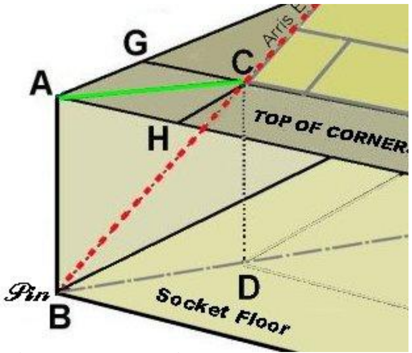

Fig. 45 A pin at B marks the extreme corner of both socket floors in the NE and NW corners. ∠CBD 42°

When I was there in 1978, the sockets were dismantled and quite worn, but I personally saw the *bronze pins*[ff] in the Northeast and Northwest sockets. The pins are in the sockets' true corners. On the NE corner, the pin (at **B** in Fig. 45) is 28.5 inches below the level of the platform, (line **AB** in Fig. 45.) On the NW corner the pin is 32.8 inches below. There are no pins on the SW and SE corner sockets but their respective depths are 22.9 inches and 39.90 inches below platform level.

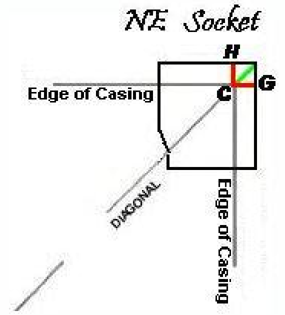

Fig. 44 Distance from edge of socket to corner of casing varies from corner to corner.

101. Surveys note that diagonals drawn across the base of the Pyramid are amazingly accurate in that each intersects both the corner of the casing and the corner of the corresponding socket. The distance from the top of the cornerstone **(A)** to the corner of the rising casing stones (**C**) though different on each corner, is regulated by the constancy of the Pyramid arris angle of about 42°. The deeper the socket, the farther out the corner (**A**). The distance from the casing **(C)** to the outside edges of the corner stone (at points **G** and **H** in Fig. 45) varies from 18 inches to 31 inches as noted below. In order to account the sockets as part of the base perimeter, these eight additional lengths, two on each corner, must be added to the perimeter of the casing stones at platform level. The amounts per corner follow:

The NE corner would contribute an additional **22.36493094"**
The NW corner would contribute an additional **25.78333529"**
The SW corner would contribute an additional **18.02330234"**
The SE corner would contribute an additional **31.30402104"**
97.47558961"

[cc] 36514.67434 inches mathematically or

[dd] 3042.889528 feet

[ee] "Nearly" square owing to the slight inclination in azimuth, 3'55" to the west of north, on the west side of the Pyramid.

[ff] The bronze pins were set modernly and function as a point of reference. I measured from the NE socket pin to the middle of the north side, 380.3+ feet.

The sum of the figures above times 2 equals: **194.95**11792 inches *additional* platform to be added to the perimeter of casing. The difference in the two perimeters is approximately as follows:

Perimeter of casing only:

756.66 ft. per average side x 4 = 3026.67 ft

3026.67 ft x 12” = **36320** inches perimeter of casing

+ **194.95** inches addition from corner sockets

36515 inches or 3042.9 feet

Perimeter including Sockets

102. For the want of a little flexibility, it can be seen that *two* perimeters are intended. Both perimeters, one around the casing and one which includes the sockets, work together. Where others have sighted the mean side of the base (where casing meets platform) at 9072+/- inches, our measure for the *mean* side of the Pyramid base (including corner sockets) is **9128.75** canon inches--the **K (1.01430555)** of **9000,** **K** being the ratio of **365.15** to **360**, the ratio of the cycle of the year to the circle of degrees. (Incidentally it can be recalled that the combined volumes of the four corner sockets plus the 5th (minus the wedge) = **900** cubic feet.)

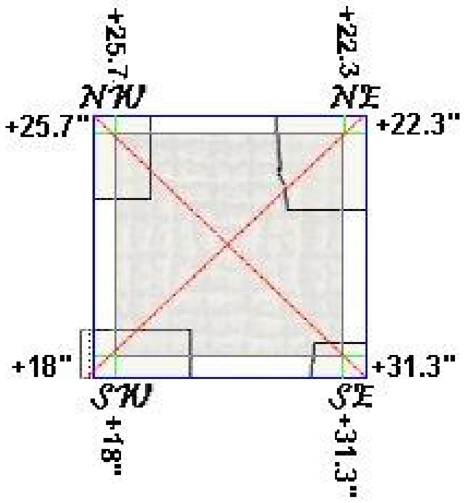

Fig. 46 Addition of the sockets to base perimeter. Not to scale.

103. Measured at the level of the pavement, behind the casing stones, the core of the Pyramid would have averaged closer to **9,000** inches on one side, and **36,000** inches around. The juxtaposition of the two perimeters, 36,515" and 36,000" produces an esthetically pleasing harmonic of number--one figure relating to natural process and the cycle of the year, the other figure to the abstraction of mathematics and the circle of degrees. Interestingly enough the product of the two figures divided by 10, is the canon number of feet in the circumference of the Earth: **131,454,000**, again linking the base of the Pyramid to a model of the Earth.

104. One final note regarding the significance of the base measure. The sum of the four sides of the Pyramid as we configure it, including the additional lengths of the sockets is **36,320.04882".** Observe the synchronicity in the following relationship between **10,$^{-e}$** the canon meter, and the base perimeter. (The canon meter is **39.46362"** in length or **3.28635')**

(10^{-e}) = 2.30258509

2.30258509 x 100 = 230.258509

230.258509 x **3.28635’** = **756.7**10052 feet

756.71 feet times four sides would be **3,026.84**0208 feet all around or **36,322.**0825 inches, *as derived from the number **10**--*a miniscule discrepancy from the measure of 36,320.04882".

Once again we find reverence for the number **10** monumentalized at both the top of the Pyramid, in the extended space of the projected apex where the height of its geometrical tip, 484.8136 feet, is the number of the tangent of one second of arc, .000004848136 and at the foundation of the Pyramid in the measure of its perimeter. The Pyramid *is* the one thing: one heartbeat, one second of time, one second of arc.

Dimensions and Angles of the
Appendix II NE Corner Socket of Cheops Pyramid

October 3, 2012
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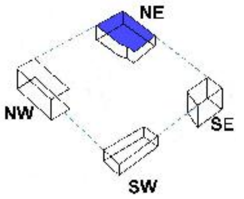


Corner Socket and Stone

Side Lengths:

BA	137.3333333"
DA	152.1458333"
ED	122.7400036"*
FE	25"
CF	20.8946944"
BC	114.1083573"

Socket Depth: 28.50683155"*

Diagonals:

BD	204.9604831"
AC	174.7572816"
AF	183.5734372"
AE	200.7174325"*

Angles:

∠ABC	87.54767429°
∠ADE	93.18330533°
∠AED	49.18644438°
∠EAD	37.63025029°
∠BCA	51.73290171°
∠BAC	40.719424°
∠BCF	111.8880047°
∠CFA	62.04927624°
∠CAF	6.062719017°
∠FAE	5.433211589°
∠AFE	130.5181474°
∠BHA	40.83621104°
∠DEG	3.154037468°

Areas:

ΔAEDA	9322.790276 sq "
ΔABCA	7828.264603 sq "
ΔACFA	1694.139572 sq "
ΔAFEA	1744.407107 sq "
ΔEGDE	413.8180759 sq "
ΔBHEFCB	818.7179441 sq "

Top Surface Area Stone:
☐**BCFEDAB** 20589.60156 sq"

Top Plane Perimeter of Stone:
ABCFEDA 572.2222"

Volume of Stone: 586,944.3033 cu"
339.6668422 cubic feet

Rectangular Enclosure Dimensions:

Side Lengths of Rectangular Enclosure:

AG, BH, LM, KN	158.8990601"
AB, HG	137.3333333"
AM, BN, HK, GL	28.50683155"*

Inner Rectangle **AJEGA:**

AG, JE	158.8990601"
AJ, EG,	122.55418"

Smaller Exterior Rectangle **BJEHB:**

BJ, HE	14.77915326"
BH, JE	158.8990601"
(DG	6.753226629")

Top Plane Diagonal Rect. Enclosure:

BG, HA	210.0222744"

Major Diagonal Rectangular Enclosure:

GN	211.9480955"
∠GNL	7.729657219°

Angles:

∠AGE	90°
∠GDE	86.84576263°
∠FEA	44.04864104°

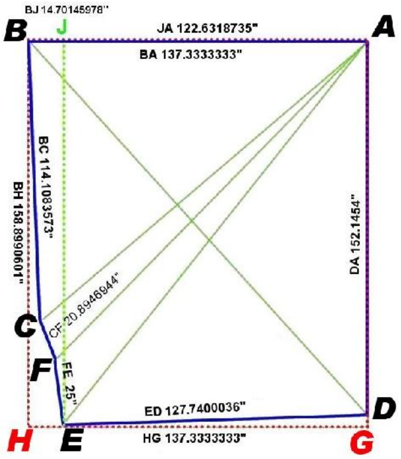
Top Plane Perimeter:

ABHGA	592.4647868"

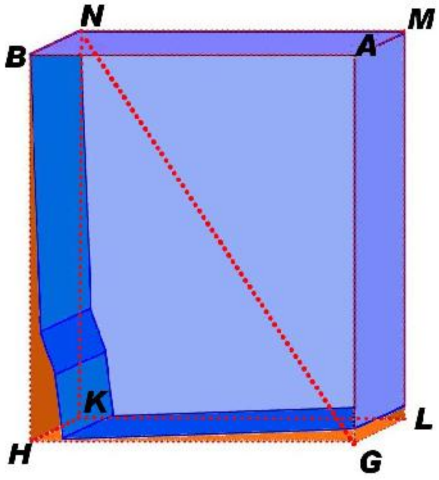
Top Surface Area:

☐**BHGAB**	21822.13758 sq."

Volume of Rectangular Enclosure:
622,080 cubic"



NE Socket Dimensions



Imaginary Rectangularized Areas in orange.

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*This number is "fitted." The mathematically perfect requirement would be slightly different than given. Exactitude is theoretically possible, but not physically--

Perfection can only be indicated. The following figures are mathematically "correct" but not "fitting" to the intended:

South end ED: 122.8085546" **Socket depth: AM 28.50237258"**

Appendix III

Dimensions and Angles of the
NW Corner Socket of Cheops Pyramid

October 3, 2012

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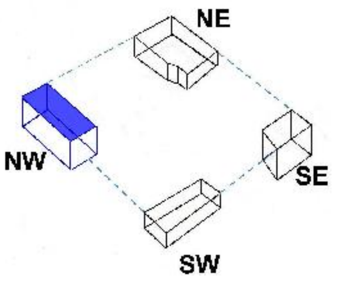


Side Lengths

AB	85.9538238″
BC	150.8152373″
CD	86.0472222″
AD	151.5426224″

Surface Area

□**ABCDA** 13,000.54709 sq in
90.28157701 sq feet

Volume 427,243.4793 cu in
247.2473838 cu feet

Depth 32.8635"

Perimeter 474.3589057"

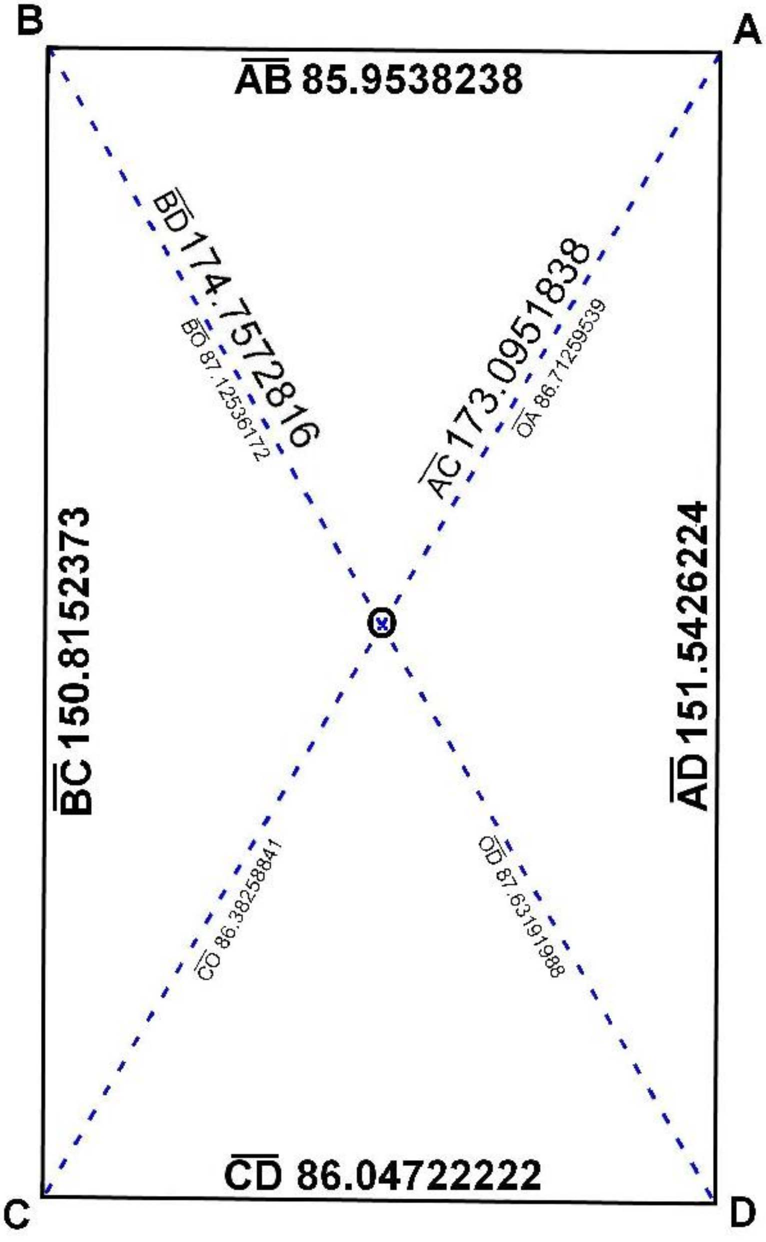
∆BCDB	6487.880735 sq"
∆BCDB	45.05472733 sq′
∆BADB	6512.666355 sq"
∆BADB	45.22684968 sq'
∆ABCA	6481.431602 sq"
∆ABCA	45.00994168 sq'
∆ACDA	6519.115488 sq"
∆ACDA	45.27163534 sq'

Diagonals

AC	173.0951838″
BD	174.7572816″
OD	87.63191988″
OC	86.38258841″
OB	87.12536172″
OA	86.71259539″

Angles

∠BAC	60.60608838°
∠BCA	29.7725957°
∠ACD	61.09003063°
∠CAD	29.80493078°
∠ABC	89.62131592°
∠BDC	59.64382698°
∠CBD	29.4935464°
∠ADC	89.10503868°
∠BCD	90.86262662°
∠ADB	29.46121132°
∠ABD	60.12776952°
∠BAD	90.41101916°



Appendix IV

Dimensions and Angles of the *SW Corner Socket of Cheops Pyramid*

October 3, 2012

©BERNARD I. PIETSCH

Side Lengths Socket

PU	139.4186925″
UY	71.73845089″
FY	142″
FP	75.19763434″
U^1Y	71.69039307"
UU^1	2.5813075"

Depth

22.97233881"

Diagonals

FU	156.7315652″
PY	160.6819349″

Inner Triangle Areas

ΔPUYP	4,991.304888 sq"
ΔPFYP	5,339.032038 sq"
ΔUFYU	5,090.017908 sq"
ΔPUFP	5,240.319018 sq"

Top Plane Area

□PUYFP 10,330.33693 sq″

Volume

137.3333333 cu ft

237,312 cu in

Key Form Dimensions

Side Lengths

OP	17.56410419"
OB	74.87656654"
BF	17.47572816"
FP	75.19763434″

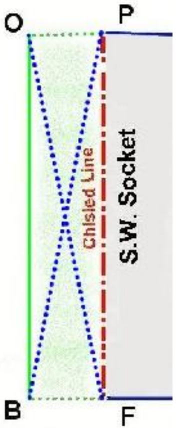
Diagonals

OF	76.90830616"
BP	77.20158862"

Area

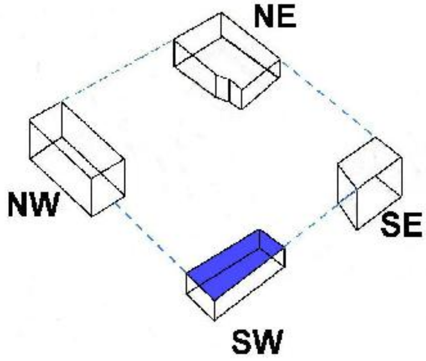
1,314.54 sq in

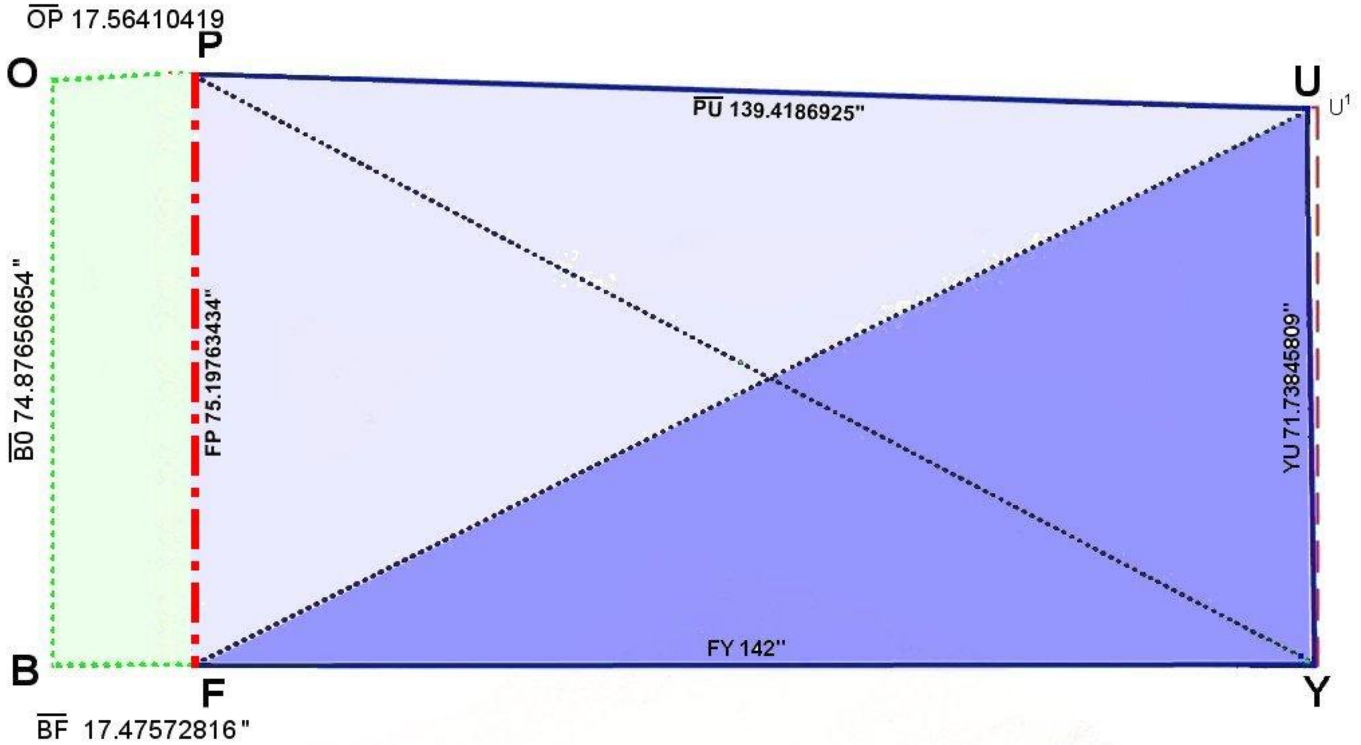
9.12875 sq ft



Angles

∠FYU^1	90°	∠FUP	28.66152123°
∠FYU	87.90266457°	∠PYU	59.99872403°
∠FU^1Y	63.21252583°	∠FPU	88.55850516°
∠U^1FY	26.78747164°	∠PFU	62.77997361°
∠FUY	64.87730902°	∠FYP	27.90394058°
∠PFY	90°	∠UFY	27.22002641°
∠PUY	93.53883021°	∠FPY	62.09608942°

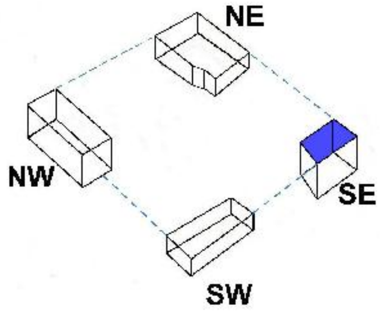




Appendix V

Dimensions and Angles of the
SE Corner Socket of Cheops Pyramid

October 3, 2012
©BERNARD I. PIETSCH



Side Lengths

AB	81.57102733"
AC	51.62833333"
BD	52.5816"
DC	86.04722222"
DE	4.479754899"
CE	81.56746727"
BE	52.39042331"

Socket Depth
39.90017909"

Top Perimeter
271.8281828"

Major Diagonal Stone
107.9891886"

Volume of Stone
173,951.481 cu"
100.6663663 cu ft

Surface Areas of Planes

☐ **TOP** 4359.623808 sq"
30.27516523 sq ft
☐ **N SIDE** 3254.73059 sq"
☐ **W SIDE** 2098.035885 sq"
14.56969364 sq ft
☐ **S SIDE** 3433.333333 sq"
☐ **E SIDE** 2060 sq"

Top Plane Diagonals

AD	100.3474426"
AE	96.53360306"
BC	96.94332453"

Angles

∠**AEC**	32.33186787°	∠**BDC**	85.11269011°
∠**ADC**	30.96375654°	∠**BAD**	31.49905903°
∠**ACB**	57.2875463°	∠**BDA**	54.14893359°
∠**ABD**	94.35200738°	∠**BCE**	32.71245371°
∠**ABE**	89.46469749°	∠**BAE**	32.86717036°
∠**ABC**	32.17715121°	∠**BEA**	57.66813214°
∠**ACE**	90°	∠**CBD**	62.17425408°
∠**BAC**	90.53530249°	∠**DAC**	59.03624346°
∠**BCD**	32.7122496°	∠**DBE**	4.887309841°

Triangular Areas

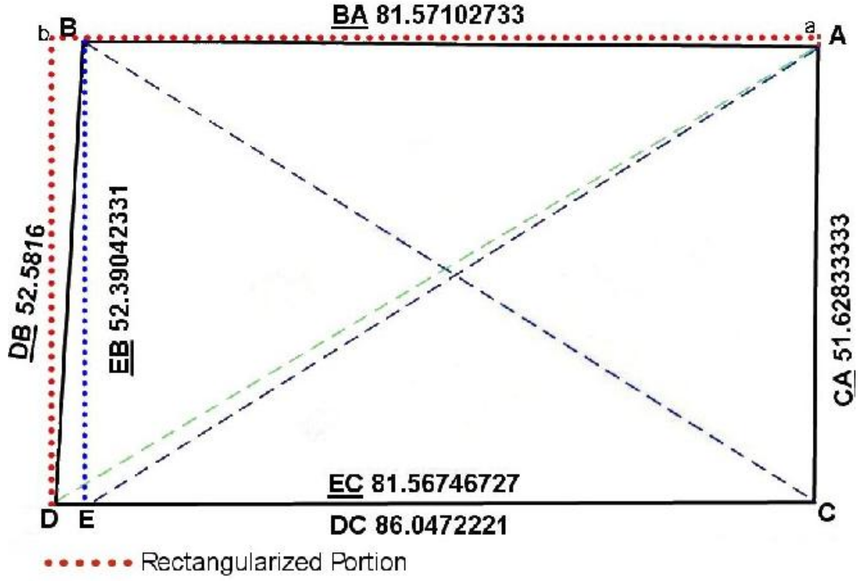
ΔACDA	2221.239751 sq"
ΔABDA	2138.384057 sq"
ΔBCDB	2254.027905 sq"
ΔABCA	2105.595898 sq"
ΔDBED	117.3481278 sq"

Rectangularized Enclosure

ab	**86.04722222"**
bD	**52.39042331**

Major Diagonal of Box
97.77228382"

Volume Box 179,872.0182 cu"
104.0926031cu ft



Appendix VI
Dimensions and Angles of the 5th Socket of Cheops Pyramid

October 3, 2012

Polygonal Side Lengths

AD, FJ,	30.9"
CD, IJ,	97.08737864"
AE, FH,	97.35745649"
CE, HI,	23.65325998"
AF, DJ, CI, EH	41.2"

Plane Diagonal Lengths of Polygon

AC, FI	101.8860594"
DE, JH	99.92715246"
AJ, DF	51.5"
DI, CJ	105.4675262"
AH, EF	105.7161971"
EI, CH	47.50701746"

Major Diagonals of Polygon

EJ, DH	108.0873526"
AI, CF	109.9009058"

Polygon Side Plane Areas

☐ADJFA	(N end)	1,273.08 sq"
☐CEHIC	(S end)	974.514311 sq"
☐AEHFA	(NE side)	4,011.127207 sq"
☐CDJIC	(SW side)	4,000.000000 sq"
☐ADCEA	(top)	2,648.216504 sq"
☐FJIHF	(bottom)	2,648.216504 sq"

Polygon Major Diagonal Planes

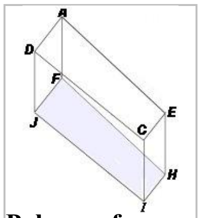
☐DEHJD	4,116.998681 sq"
☐ACIFA	4,197.705647 sq"

Surface Area Polygon

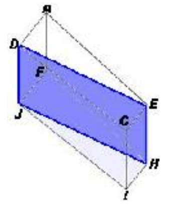
15,555.15453 sq inches
108.0219065 sq feet

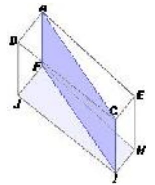
Volume of Polygon (Actual Stone Form)

109,106.52 cubic inches
63.14034719 cubic feet

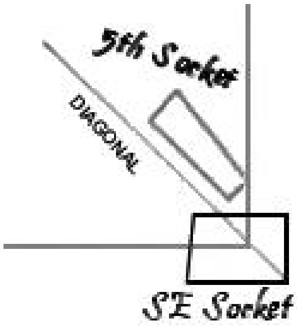


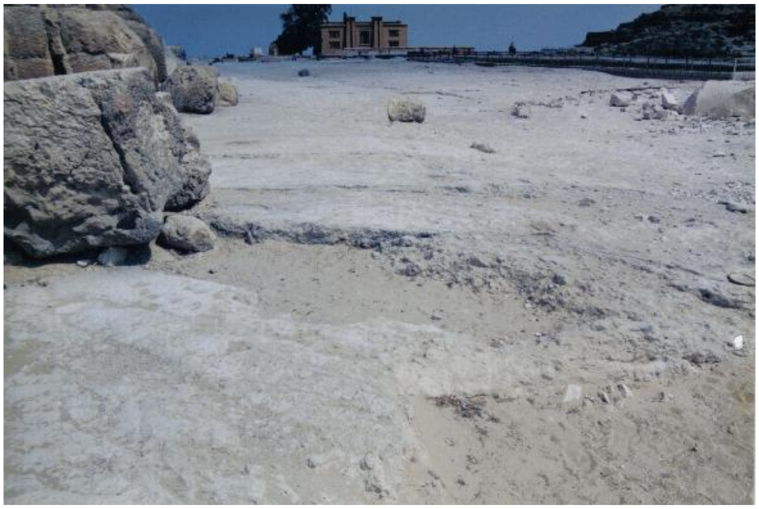
Polygon form Socket Stone.





Diagonal Planes of Polygon





5th Socket depression in center. Portion of SE socket in foreground right corner. 1995 photo. BIP

5th Socket Dimensions Appendix VI Page 2

Wedge Dimensions (Exterior & Interior)

Side Lengths

AF, GB, EH 41.2"
AB, FG 97.08737864"
BE, GH 7.24674002"
AE, FH 97.35745649"

Top Plane of Wedge

Area

□ABEA 351.7834961 sq"
2.4429409 sq'
□AEHF 4,011.127207 sq"
27.85505005 sq'
∠BAE 4.268722708°

Volume Wedge :

14,493.4805 cu"
8.387430579 cu'

Volume Extr + Intr. Wedges:

28,986.9601 cu"

Polygon Volume minus Intr. Wedge:

94,613.0399 cu"

Rectangular Enclosure Dimensions

Height:

AF, DJ, CI, BG 41.2"

Width:

AD, FJ, BC, GI 30.9"

Length:

AB, CD, FG, IJ 97.08737864"

Diagonals:

AC, FI, GJ ,BD 101.8860594"

Major Diagonals:

AI, BJ, DG,CF 109.9009058"
" “ 9.158408817 ft.

Rectangularized Top Plane Area

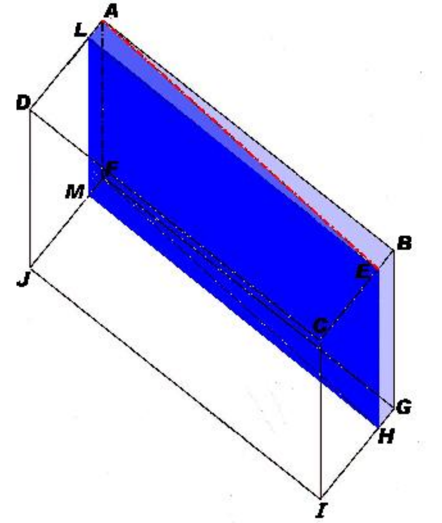
□ABCD, □FGIJ 3000 sq '

Surface Area:

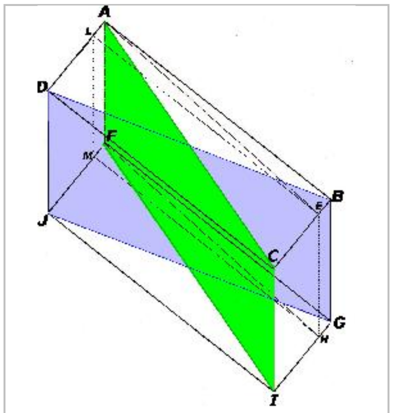
16,546.16 sq"
114.9038888 sq'

Rectangularized Volume:

123,600 cu"
71.52777cu'



Interior and Exterior Wedges shown. Addition of wedge to polygon makes it rectangular. Subtraction of wedge from polygon also makes socket form rectangular.



Diagonal Plane of Rectangularized Form

5th Socket in background left corner. SE Socket foreground center. 1995 BIP

Appendix VII: D. Davidson's Schematic of Base of Great Pyramid

MEASUREMENTS AND LEVELS OF THE EXISTING DETAILS OF THE GREAT PYRAMID'S EXTERIOR

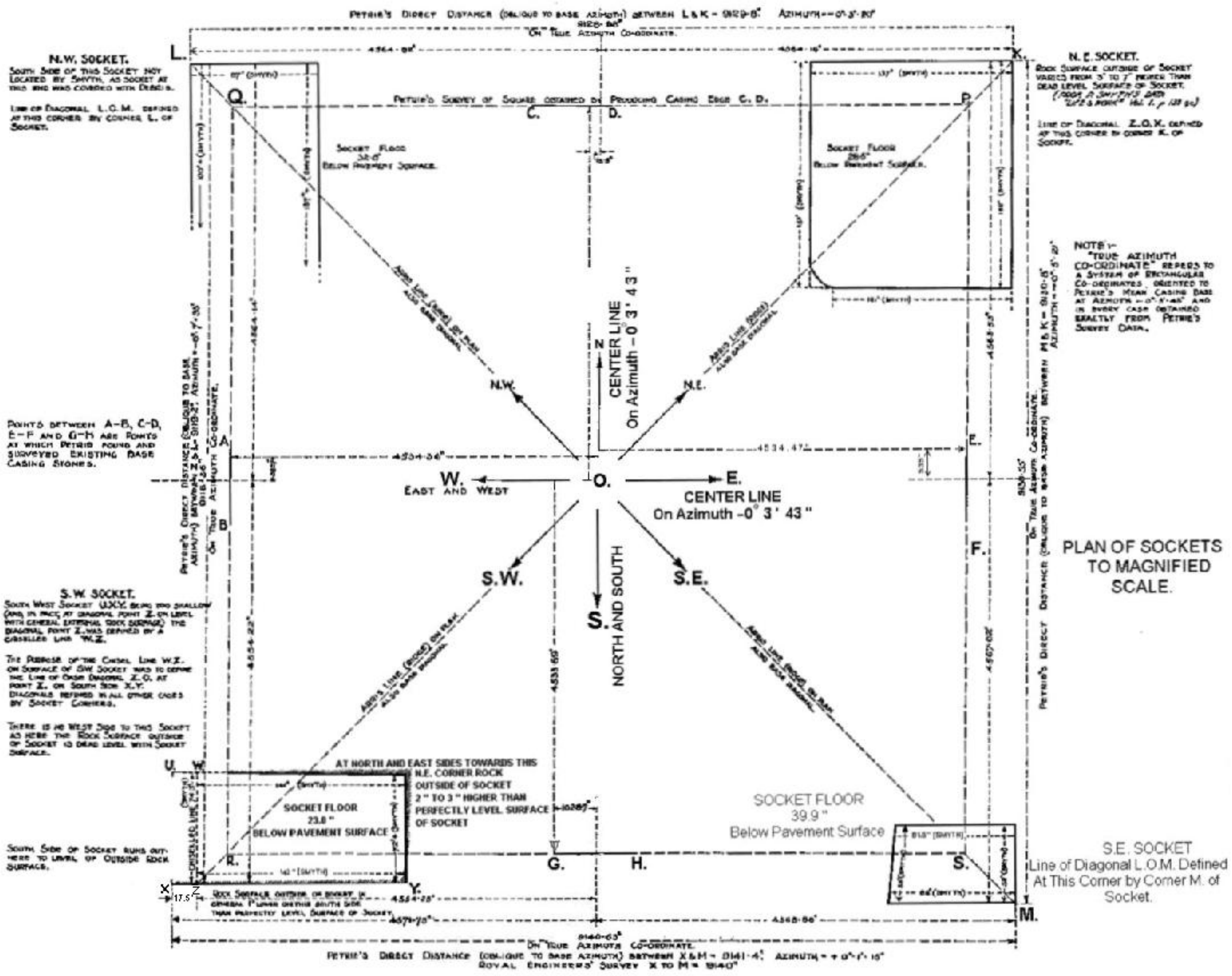

PETRIE'S DIRECT DISTANCE (OBLIQUE TO BASE AZIMUTH) BETWEEN L & K - 9129·8". AZIMUTH = -0°-3'-20"
9128·80"
ON TRUE AZIMUTH CO-ORDINATE.
4564·98"
4564·16"
L.
K.
N.W. SOCKET.
SOUTH SIDE OF THIS SOCKET NOT LOCATED BY SMYTH, AS SOCKET AT THIS END WAS COVERED WITH DEBRIS.
LINE OF DIAGONAL L.O.M. DEFINED AT THIS CORNER BY CORNER L. OF SOCKET.
Q.
PETRIE'S SURVEY OF SQUARE OBTAINED BY PRODUCING CASING EDGE C. D.
C.
D.
SOCKET FLOOR 32·6" BELOW PAVEMENT SURFACE.
N. E. SOCKET.
ROCK SURFACE OUTSIDE OF SOCKET VARIES FROM 5" TO 7" HIGHER THAN DEAD LEVEL SURFACE OF SOCKET. (FROM P. SMYTH'S "LIFE & WORK" VOL. I. p. 128 &c.)
LINE OF DIAGONAL Z.O.K. DEFINED AT THIS CORNER BY CORNER K. OF SOCKET.
P.
SOCKET FLOOR 28·6" BELOW PAVEMENT SURFACE.
NOTE:- "TRUE AZIMUTH CO-ORDINATE" REFERS TO A SYSTEM OF RECTANGULAR CO-ORDINATES, ORIENTED TO PETRIE'S MEAN CASING BASE AT AZIMUTH = -0°-3'-43" AND IN EVERY CASE OBTAINED EXACTLY FROM PETRIE'S SURVEY DATA.
PETRIE'S DIRECT DISTANCE (OBLIQUE TO BASE AZIMUTH) BETWEEN M & K = 9130·8"
AZIMUTH = -0°-3'-20"
ON TRUE AZIMUTH CO-ORDINATE.
CENTER LINE On Azimuth -0° 3' 43"
N
N.W.
N.E.
AXIS LINE (RIDGE) ON PLAN ALSO BASE DIAGONAL
POINTS BETWEEN A-B, C-D, E-F AND G-H ARE POINTS AT WHICH PETRIE FOUND AND SURVEYED EXISTING BASE CASING STONES.
PETRIE'S DIRECT DISTANCE (OBLIQUE TO BASE AZIMUTH) BETWEEN Z & L - 9119·2". AZIMUTH = -0°-7'-35"
9118·36"
ON TRUE AZIMUTH CO-ORDINATE.
A.
B.
4564·14"
4554·34"
4534·47"
E.
F.
W.
EAST AND WEST
O.
E.
CENTER LINE On Azimuth -0° 3' 43"
S.W.
S.E.
S.
NORTH AND SOUTH
PLAN OF SOCKETS TO MAGNIFIED SCALE.
S.W. SOCKET.
SOUTH WEST SOCKET U.X.Y. BEING TOO SHALLOW (AND, IN FACT, AT DIAGONAL POINT Z. ON LEVEL WITH GENERAL EXTERNAL ROCK SURFACE) THE DIAGONAL POINT Z. WAS DEFINED BY A CHISELLED LINE W.Z.
THE PURPOSE OF THE CHISEL LINE W.Z. ON SURFACE OF SW SOCKET WAS TO DEFINE THE LINE OF BASE DIAGONAL Z.O. AT POINT Z. ON SOUTH SIDE X.Y. DIAGONALS DEFINED IN ALL OTHER CASES BY SOCKET CORNERS.
THERE IS NO WEST SIDE TO THIS SOCKET AS HERE THE ROCK SURFACE OUTSIDE OF SOCKET IS DEAD LEVEL WITH SOCKET SURFACE.
SOUTH SIDE OF SOCKET RUNS OUT HERE TO LEVEL OF OUTSIDE ROCK SURFACE.
4554·22"
4533·60"
U.
W.
AT NORTH AND EAST SIDES TOWARDS THIS N.E. CORNER ROCK OUTSIDE OF SOCKET 2" TO 3" HIGHER THAN PERFECTLY LEVEL SURFACE OF SOCKET
SOCKET FLOOR 23.8" BELOW PAVEMENT SURFACE
CHISELLED LINE
R.
142" (SMYTH)
X
17.5"
Z.
Y.
ROCK SURFACE OUTSIDE OF SOCKET IN GENERAL 1" LOWER ON THE SOUTH SIDE THAN PERFECTLY LEVEL SURFACE OF SOCKET.
4554·28"
4571·75"
G.
H.
SOCKET FLOOR 39.9" Below Pavement Surface
S.
S.E. SOCKET Line of Diagonal L.O.M. Defined At This Corner by Corner M. of Socket.
M.
4568·86"
9140·63"
ON TRUE AZIMUTH CO-ORDINATE.
PETRIE'S DIRECT DISTANCE (OBLIQUE TO BASE AZIMUTH) BETWEEN X & M - 9141·4". AZIMUTH = +0°-1'-15"
ROYAL ENGINEERS' SURVEY X TO M = 9140"

Plate XX. From D. Davidson and H. Aldersmith, The Great Pyramid Its Divine Message, Volume 1. Fourth revised edition, 1927. Petrie and Smyth's measures are noted.

Appendix VIII : Beginning of a Metrological Lexicon

Calendrical Units
Solar Year @ 365¼ days
Sidereal Year @ 366 ¼
Canon Year @ 360 Canon Days
Canon Day: 24.4333 hours
1460.6 minutes
87636 seconds

Precessional Cycle Frequencies
Canon Years: 25,825.84232
Years per Degree: 71.738

Linear Measures
Mile: 5258.16'
Foot: 12"
Inch: 1
Hebrew Cubit (Remen): 17.47572816"
Common Cubit: 20.6"
Sacred Cubit: 25"
Furlong: 657.27'

Equatorial Measures
Canon Miles: 25,000
Feet: 131,454,000
Inches: 1,577,448,000
Furlongs: 200,000

Physical Constants

- **G (**gravity) 35.15'
- Speed of light: 185,400 canon miles/second
- **1^{e}** 2.718281828
- **1.22806** *feet* pendulum length has a period (swings forth and back) in **1.22806** *seconds* of time.

Mathematical Operators
Canon **π :** 3.14198363
e: 2.718281828
Natural Logarithms
Common Logarithms
Conversion natural to common logarithms:
2.302585093
Frequency of pendulum

Geometric/Trigonometric Terms
360 Degrees of arc
2160 Minutes
1,296,000 seconds
Sine
Cosine
Tangent
Spherical Volume
Surface Area
Major Diagonal
Rectangular Area

Magnetic Assignments at Pyramid 2900 BCE
Dip angle: 51° 51′+
Declination of Compass: 13.3° West